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ABSTRACT

This publication contains the text of House Joint Resolution 226, which establishes a policy that Federal records, books, and publications of enduring value be produced on acid free permanent papers; recommends that federal agencies and American publishers require the use of acid free permanent papers for publications of enduring value; recommends that statistics be kept on the present production of acid free papers and the volume of production; recommends that the Secretary of State make known the national policy; and directs the Librarian of Congress, the Archivist of the United States, and others to monitor progress in implementing the national policy. The publication includes statements in support of the legislation from James H. Billington, the Librarian of Congress; Representative Pat Williams; Lawrence Hughes, the Association of American Publishers; and Don W. Wilson, the Archivist of the United States. Extensive appendices include the following: (1) responses from the Archivist to questions raised by the subcommittee about computer applications needed or in place at the National Archives; (2) the text of an instructional guide on managing electronic records; (3) information about the Library of Congress's Machine-Readable Collections Reading Room (MRCRR) and a copy of the first year, pilot program report of the accomplishments of the MRCRR; (4) information from the Association of Research Libraries on the use of alkaline paper and paper preservation; (5) comments from the Government Printing Office (GPO) on the legislation and a copy of the GPO's plan for use of alkaline paper, which includes statistics about paper production and comparative costs of acid and alkaline papers; and (6) statements about the proposed legislation from the New York Public Library, the American Library Association, and other interested parties. (KRN)

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TO ESTABLISH A NATIONAL POLICY ON PERMANENT PAPERS

HEARING

BEFORE THE

GOVERNMENT INFORMATION, JUSTICE, AND AGRICULTURE SUBCOMMITTEE

OF THE

COMMITTEE ON GOVERNMENT OPERATIONS HOUSE OF REPRESENTATIVES

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

ON

H.J. RES 226

TO ESTABLISH A NATIONAL POLICY ON PERMANENT PAPERS

FEBRUARY 21, 1990

Printed for the use of the Committee on Government Operations

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TO ESTABLISH A NATIONAL POLICY ON PERMANENT PAPERS

WEDNESDAY, FEBRUARY 21, 1990

HOUSE OF REPRESENTATIVES,
GOVERNMENT INFORMATION, JUSTICE,
AND AGRICULTURE SUBCOMMITTEE
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, DC.

The subcommittee met, pursuant to notice, at 10 a.m., in room 2247, Rayburn House Office Building, Hon. Robert E. Wise, Jr. (chairman of the subcommittee) presiding.

Present: Representatives Robert E. Wise, Jr., Edolphus Towns, Gary A. Condit, and Ileana Ros-Lehtinen.

Also present: Representative Pat Williams.

Staff present: Robert Gellman, chief counsel; Aurora Ogg, clerk; and Monty Tripp, minority professional staff, Committee on Goverment Operations.

OPENING STATEMENT OF CHAIRMAN WISE

Mr. WISE. I call this session of the Subcommittee on Government Information, Justice, and Agriculture to order.

I want to begin this hearing by reading a short passage from "The Name of the Rose," a novel set in a 14th century Italian abbey noted for its library.

The statement I will read is by the abbot and I hear in it an echo of the concerns that we will consider today:

> A book is a fragile creature, it suffers the wear of time, it fears rodents, the elements, clumsy hands. If for a hundred and a hundred years everyone had been able freely to handle our codices, the majority of them would no longer exist. So the librarian protects them not only against mankind but also against nature, and devotes his life to this war with the forces of oblivion, the enemy of truth.

Today, the subcommittee will consider a modern threat to books. Books printed in the last hundred years are being destroyed from within. The acids used in the production of modern paper eventually attack the paper and make books unusable. Our libraries are now filled with books that are rapidly deteriorating, and we are spending millions of dollars to preserve these books before it is too late.

H.J. Res. 226 proposes a national policy on permanent papers. The joint resolution is designed to heighten awareness of the problem and to generate reports from some of the Federal agencies that are most affected. A similar resolution, S.J. Res. 57, has already passed the Senate.

Of course as a Member of Congress the most shocking thing is to realize that the Congressional Record in which you think you are enscribing your words forever will be dust probably before you are, and therefore, this is something we have to act on with dispatch.

I made a 1-minute speech the other day that was just dynamite and I want to make sure that it lasts at least as long as the quote, not as long as this book.

[The joint resolution, H.J. Res. 226, follows:]

IA

101ST CONGRESS
1ST SESSION

H. J. RES. 226

To establish a national policy on permanent papers.

IN THE HOUSE OF REPRESENTATIVES

MARCH 23, 1989

Mr. WILLIAMS (for himself, Mr. ANNUNZIO, Mr. YATES, Mr. WALGREN, Mr. OWENS of New York, and Mrs. BOGGS) introduced the following joint resolution; which was referred jointly to the Committees on Government Operations and House Administration

---

JOINT RESOLUTION

To establish a national policy on permanent papers.

Whereas it is now widely recognized and scientifically demonstrated that the acidic papers commonly used in documents, books, and other publications for more than a century are self-destructing and will continue to self destruct;

Whereas Americans are facing the prospect of continuing to lose national historical, scientific and scholarly records, including government records, faster than salvage efforts can be mounted despite the dedicated efforts of many libraries, archives, and agencies, such as the Library of Congress and the National Archives and Records Administration;

Whereas the Congress has already appropriated $50,000,000 to the National Archives and Records Administration, $32,000,000 to the Library of Congress, and $2,400,000 to

the National Library of Medicine for deacidifying or microfilming books too brittle for ordinary use, and $25,000,000 to the National Endowment for the Humanities for grants to libraries and archives for such purposes;

Whereas nationwide many hundreds of millions of dollars will have to be spent by the Federal, State, and local governments and private institutions to salvage the most essential books and other materials in the libraries and archives of academic and private institutions;

Whereas there is an urgent need to prevent the continuance of the acid paper problem into the indefinite future;

Whereas acid free permanent papers with a life of several hundred years already are being produced at prices competitive with acid papers;

Whereas the American Library Association Council in a resolution dated January 13, 1988, has urged publishers to use acid free permanent papers in books and other publications of enduring use and value, and other professional organizations have expressed similar opinions;

Whereas some publishers such as the National Historical Publications and Records Commission, the Library of Congress and many university presses are already publishing on acid free permanent papers, and the Office of Technology Assessment has estimated that only 15 to 25 percent of the books currently being published in the United States are printed on such paper;

Whereas even when books are printed on acid free permanent paper this fact is often not made known to libraries by notations in the book or by notations in standard bibliographic listings;

Whereas most Government agencies do not require the use of acid free permanent papers for appropriate Federal records and publications, and associations representing commercial publishers and book printers have thus far not recommended the use of such papers;

Whereas paper manufacturers have stated that a sufficient supply of acid free permanent papers would be produced if publishers would specify the use of such papers; and

Whereas there is currently no statistical information from public or private sources regarding the present volume of production of acid free permanent papers and the volume of production required to meet an increased demand: Now, therefore, be it

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. It is the policy of the United States that Federal records, books, and publications of enduring value be produced on acid free permanent papers.

SEC. 2. The Congress of the United States urgently recommends the following:

(1) Federal agencies require the use of acid free permanent papers for publications of enduring value produced by the Government Printing Office or produced by Federal grant or contract, using the specifications for such paper established by the Joint Committee on Printing.

(2) Federal agencies require the use of archival quality acid free papers for permanently valuable Fed-

eral records and confer with the National Archives and Records Administration on the requirements for paper quality.

(3) American publishers use acid free permanent papers for publications of enduring value, in voluntary compliance with the American National Standard, and note the use of such paper in books, in advertisements, in catalogs, and in standard bibliographic listings.

(4) Reliable statistics be produced by public or private institutions on the present production of acid free permanent papers and the volume of production required to meet the national policy declared in section 1.

(5) The Secretary of State make known the national policy regarding acid free permanent papers to foreign governments and appropriate international agencies since the acid paper problem is worldwide and essential foreign materials being imported by our libraries are printed on acid papers.

SEC. 3. The Librarian of Congress, the Archivist of the United States, the Director of the National Library of Medicine, and the Administrator of the National Library of Agriculture shall jointly monitor the Nation's progress in implementing the national policy declared in section 1 regarding acid free permanent papers and report annually to the Con-

1 gress regarding such progress by January 1, 1991, and each
2 succeeding year thereafter.

Mr. WISE. So having said that, I want to appreciate and thank the witnesses who are here.

What I will do is to move to the second panel which is Dr. James H. Billington, the Librarian of Congress; Dr. Don Wilson, the Archivist of the United States; and Lawrence Hughes, chairman of the Association of American Publishers.

Gentlemen, if you will take your place. It's the practice of the subcommittee to swear all witnesses so as not to prejudice any witness who may appear. If you would stand and hold up your right hand.

[Witnesses sworn.]

Mr. WISE. Please begin. Your statements in their entirety will be made part of the record. Feel free to summarize in any way you wish. And we will start in the order listed. Dr. Billington.

STATEMENT OF DR. JAMES H. BILLINGTON, LIBRARIAN OF CONGRESS

Mr. BILLINGTON. Thank you, Mr. Chairman.

I and my colleagues at the Library of Congress, and I daresay other librarians, appreciate the opportunity to speak about the important role that the production and use of permanent paper play in the survival of knowledge and information, particularly as contained in your library, the Congress' and the Nation's, and in other libraries and in national, State, and local archives.

Much of the paper that bears the written and printed record of this country's history and development over the past century, and indeed the past century-and-a-half, is in a serious state of deterioration. Millions of books contain paper that has become as brittle as the books that I hold in my hand here [indicating], Mr. Chairman.

And countless millions of other books and paper-based materials, while not yet in such an advanced state of decay, are made from paper that is acidic, and therefore, impermanent. Without intervention, these papers will also become brittle and unusable. In the Library of Congress alone, approximately 25 percent or more than 3 million of the books in our general and law collections contain paper that has already deteriorated to the point where it cannot be subjected to normal handling without risk of damage. Ninety-eight percent of the volumes in these collections are printed on acidic paper. Moreover, two-thirds of our new acquisitions come from foreign countries, many of which use very poor quality paper.

The proportions of this problem are enormous. Our Nation's intellectual heritage and the records of human civilization are seriously threatened.

The seeds of this present and even greater looming disaster were sown in the midst of a seeming industrial triumph; the advent of high-speed printing and modern papermaking in the mid-19th century in response to an unprecedented demand for greater numbers of books. More people than ever before were eager, in the words of James Madison, "to arm themselves with the power which knowledge gives."

But in response to this yearning for knowledge, machinery was invented for mechanizing the production of pulp and paper; new materials were found from which paper could be made; and new

chemical methods developed to facilitate the rapid production of paper in previously unimagined quantities. Unfortunately, these vast quantities of paper contained acidic and acid-producing materials, the continued use of which in most papers produced since 1850 has resulted in the brittle paper disaster that now threatens the world's libraries and archives.

The Library of Congress and other institutions are vigorously pursuing treatment and research programs to counter the impact on our cultural heritage of acidic and brittle papers. Microfilming is currently the best available method of capturing the information contained on brittle paper. And since 1968 the Library of Congress has microfilmed more than a quarter of a million volumes, 40 percent of all such work done in America, and is now filming some 20,000 volumes a year.

Another promising tool is the mass deacidification of acidic materials. Deacidification will capture the existing strength of paper and prolong its lifetime by a factor of 3 to 5. The Library of Congress has developed and tested and now made available for commercial or library and archival use through the U.S. Department of Commerce one of the technologies for mass deacidification process using diethyl zinc.

We are now in the process of procuring deacidification services ourselves for our collections with the expectation that it will soon be possible for the library's acidic collections to deacidified by one or another of the new technologies at the rate of 1 million volumes per year.

The Library's Preservation Research and Testing Office is also monitoring research developments in paper strengthening and will continue to explore the potential for applying this technology in the future.

The Libary of Congress has taken a leadership role in promoting preservation by helping develop standards and cooperation in preservation.

Our total budget for preservation is more that $8 million yearly, representing one of the largest preservation efforts in the world.

Congress is the direct patron of this important effort.

But addressing the problems thrust upon us by decades of acid paper production represents only part of the problem. The production and use of permanent paper is the long-term solution to ensure that the intellectural efforts of our people will be preserved for posterity.

Encouraging steps have already been taken. A substantial number of American paper companies have switched from producing acidic paper to long-lasting alkaline paper. Fortunately, alkaline paper can now be made at prices generally competitive with acidic paper.

This trend toward more permanent paper is also beginning in other countries and is being encouraged by the activiities of many interested citizens and professional organizations.

The U.S. Goverment has taken a major leadership role on this important issue through the development of policies such as those expressed in H.J. Res. 226. I applaud the efforts of Congress—I know other libraries do. This national effort outlined in H.J. Res. 226 and its companion Senate bill is being closely watched by many

other countries who are also considering action at the national level and are looking to the United States as a model.

As part of the Library of Congress' efforts to encourage permanent paper production, Mr. Chairman, our National Preservation Program Office collects and distributes information about national and international efforts to stem the tide of destruction. I have attached to this testimony a factsheet on alkaline paper activities outside the United States.

Already five State legislatures—Arizona, Connecticut, Indiana, North Carolina, and Virginia—have passed legislation that speak to the issue of permanent paper and its use for State documents. Efforts to encourage legislation on the production and use of permanent paper are underway in nine other States.

The Government of the United States—this country's largest printer—can set the example for all U.S. publishers by publishing its own documents on permanent paper. We need to set standards for paper used by Congress and by other Government agencies to document the activities of our time and the Library of Congress is prepared to support this and work with the Joint Committee on Printing in establishing standards and guidelines.

The threat posed by brittle paper to the libraries and archives of the world can be stopped. The technology for producing long-lasting papers is in place and large quantities of such paper are becoming increasingly available to publishers. Public interest in stopping the brittle paper problem continues to grow.

Governments, private industry, the scientific and technical community, the publishing industry, and library administrators all have significant roles to play in our race to secure the future of the world's heritage—the future, one might say, of the past.

H.J. Res. 226 calls attention to this need and calls on the Federal Government to set an example by beginning to stem the tide of deteriorating library and archives collections. Moreover, every book and Government document printed on acid-free paper frees up scarce Federal and State resources in the future to be used to attack the backlog of our crumbling national and international knowledge-based resources.

Thank you, Mr. Chairman. And I'll be happy to answer any questions that may arise.

[The prepared statement of Dr. Billington follows:]

Statement of James H. Billington
The Librarian of Congress
before the
Subcommittee on Government Information, Justice, and Agriculture
Committee on Government Operations
U.S. House of Representatives
February 21, 1990

Mr. Chairman and Members of the Subcommittee:

I appreciate this opportunity to speak to you about the important role that the production and use of permanent paper play in the survival of the knowledge and information contained in your Library and the nation's library -- the Library of Congress -- in other libraries and in national, state, and local archives.

Much of the paper that bears the written and printed record of this country's history and development over the past century and a half is in a serious state of deterioration. Millions of books contain paper that has become as brittle as the book I hold in my hand.

Countless millions of other books and paper-based materials, while not yet in such an advanced state of decay, are made from paper that is acidic, and therefore impermanent. Without intervention these papers will also become brittle and unusable. In the Library of Congress alone approximately 25 percent, or over 3 million, of the books in our General and Law Collections contain paper that has already deteriorated to the point where it cannot be subjected to normal handling without risk of damage. Ninety-eight percent of the volumes in these collections, which number over 15 million, are printed on acidic

2

paper. Moreover, two-thirds of our new acquisitions come from foreign countries, many of which use very poor quality paper. Major research institutions across the country and around the world have similar experiences, if not on such a large scale. The proportions of the problem are enormous, and it is not exaggeration to state that we are facing a national, if not international, disaster. Our nation's intellectual heritage and the records of human civilization are seriously threatened.

The seeds of this disaster were sown in the midst of an industrial triumph -- namely, the advent of the modern papermaking industry. The changes in papermaking that took place in the mid-19th century came in response to an unprecedented demand for greater numbers of books. More people than ever before were eager, in the words of James Madison, "to arm themselves with the power which knowledge gives."

Several important developments in papermaking occurred in response to this yearning for knowledge. Machinery was invented for mechanizing the production of pulp and paper; new materials were found from which paper could be made; and new chemical methods were developed that facilitated the rapid production of paper in quantities previously unimagined. Unfortunately, these vast quantities of paper contained acidic and acid-producing materials. The continued use of these materials in the majority of papers produced since 1850 has resulted in the brittle paper disaster that now threatens the world's libraries and archives.

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The Library of Congress and other institutions are vigorously pursuing treatment and research programs to counter the impact on our cultural heritage of acidic and brittle papers. Microfilming is currently the best available method of capturing the information contained on brittle paper. Since 1968, the Library of Congress has microfilmed more than 250,000 volumes and is now filming some 20,000 volumes a year.

Another promising tool is the mass deacidification of acidic materials. Deacidification will capture the existing strength of paper and prolong its lifetime by a factor of three to five. The Library of Congress is in the process of procuring deacidification services for its collections with the expectation that it will soon be possible for the Library's acidic collection to be deacidified at the rate of one million volumes per year.

The Library of Congress developed and tested one of the technologies for mass deacidification using diethyl zinc. This process is now available for commercial or library and archival use through the U.S. Department of Commerce.

On another front, the Library's Preservation Research and Testing Office is monitoring research developments in paper strengthening and will continue to explore the potential for applying this technology in the future.

In an effort to promote preservation on an international level, the Library of Congress has taken a leadership role in international and archival circles in the development of international standards and in international cooperation in preservation.

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Our total budget for preservation is in excess of $8 million yearly -- one of the largest preservation efforts in the world.

These important programs exist, however, only to address the problems thrust upon us by decades of acid paper production. The production and use of permanent paper is the long-term solution. Only then can we insure that the intellectual efforts of our people will be preserved on paper for posterity.

Many encouraging steps have already been taken. A substantial number of American paper companies that make fine paper have switched from the production of acidic paper to the production of long-lasting alkaline paper. Fortunately, alkaline paper can be made at prices generally competitive with acidic paper.

The trend toward permanent paper, which is also beginning in other countries, is being encouraged by the activities of interested citizens and professional organizations. Several events that took place in 1989 illustrate these efforts. The Association of American Publishers urged its members to use permanent papers in first printings of trade books; numerous authors and publishers have pledged the use of permanent paper for first printings of their books; permanent paper was a major subject of a landmark conference held at the Library of Congress on the development of statewide preservation programs; the American Library Association, the International Federation of Library Associations and Institutions, and the International

Publishers Association approved resolutions in support of the production and use of permanent paper; and the National Information Standards Organization is presently revising and updating the permanent paper standard approved in 1984.

The United States government has taken a major leadership role on this important issue through the development of policies such as those expressed in H.J. Res. 226. I applaud the efforts of Congress which has taken this leadership role. The national effort -- outlined in H.J. Res. 226 and its companion Senate bill -- is being closely watched by many other countries who are also considering action at the national level. They are looking to the United States as a model.

As part of the Library of Congress' efforts to encourage permanent paper production, our National Preservation Program Office collects and distributes information about national and international efforts to stem the tide of destruction. I have attached to this testimony a fact sheet on alkaline paper activities outside the United States.

Already five state legislatures -- Arizona, Connecticut, Indiana, North Carolina, and Virginia -- have passed legislation that speaks to the issue of permanent paper and its use for state documents. Efforts to encourage legislation on the production and use of permanent paper are underway in nine other states.

The government of the United States -- this country's largest printer -- can set the example for all U.S. publishers by publishing its own documents on permanent paper. Many of the Library's publications are already printed on permanent paper, the most recent of which is To Make All Laws, the catalog of the

exhibit mounted in honor of the 200th anniversary of the U.S. Congress. We need to expand these efforts by setting standards for paper used by Congress and other government agencies to document the activities of our time. The Library of Congress is prepared to support this and work with the Joint Committee on Printing in establishing standards and guidelines.

The threat posed by brittle paper to the libraries and archives of the world can be stopped. The technology for producing long-lasting papers is in place, and large quantities of such paper are becoming increasingly available to publishers. Public interest in stopping the brittle paper problem continues to grow. Congressional attention to the issue, exemplified by your hearing today, is helping to convince individuals, federal administrators, state authorities, and governments abroad that the need to publish on permanent paper is serious and is being taken seriously.

Governments, private industry, the scientific and technical community, the publishing industry, and library administrators all have significant roles to play in our race to secure the future of the world's heritage. H.J. Res. 226 calls attention to this need and calls on the federal government to set an example by beginning to stem the tide of deteriorating library and archives collections. Moreover, every book and government document printed on acid-free paper frees up scarce federal and state resources in the future to be used to attack the backlog of our crumbling national and international knowledge-based resources.

Thank you. I would be happy to answer questions.

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Preservation Reference Service

NATIONAL PRESERVATION PROGRAM OFFICE, LM-G07, LIBRARY OF CONGRESS, WASHINGTON, DC 20540 (1) (202) 287-1840 (2) 707-1836

Preservation Information Series:
Materials and Standards
December 1989

Fact Sheet

Alkaline Paper: Activities Outside the United States

Austria

At least three mills are producing permanent paper. These are Neusiedler (which produces copying paper to the Austrian Standard A1119), Leykam Muerztaler, and Hallein Papier. Incentives for alkaline paper production are environmental and economic (alkaline is cheaper to produce). Much of the paper produced is exported. Publishers are reluctant to use permanent paper. A permanent paper standard exists that is similar to the ANSI standard in the U.S. No legislation has been initiated on this subject in Austria.

Denmark

Is the secretariat for International Standards Organization Technical Committee 46, Sub-Committee 10, which is working on an international standard for permanent paper. Denmark has one large paper manufacturer, with several mills. Most of these mills produce alkaline paper. The permanent paper produced is marketed with the copyrighted name: Permalife.

Until 1960, the Danish National Archives had the legal right to instruct the government on what paper, ink, etc. to use in producing publications. Now this can only be done on a more informal basis, but it is done regarding permanent paper. Grass roots activity promoting the use of permanent paper in Denmark is increasing, led by the Danish Society for Book Crafts.

Finland

The last of the paper mills in Finland went alkaline in April 1989. By law, the national archives determines what materials and methods are to be used for records to be kept permanently. No legislation has been initiated on this subject in Finland.

Germany	Some companies produce alkaline paper, including Nordland and Feldmuehle. Although some mills produce alkaline paper, the mother companies produce acid paper; result is that alkaline papers are not advertised. No environmental standards are driving shift to alkaline. A standard is in the process of development. No legislation has been initiated on this subject in Germany.
Hungary	One mill produces alkaline paper.
Netherlands	A standard is being developed for permanent copy paper.
Norway	All new mills in Norway will be alkaline. At present, there are two major paper manufacturers. One converted five years ago to alkaline production and is responsible for 50% of yearly production of book paper for Norway. But, much of this is exported (much paper is also imported to Norway). The other paper mill has introduced alkaline fillers, but with an alum size. This mill is considering shifting to an alkaline size. Estimates are that 40% of new books in Norway are printed on alkaline paper. The major publisher in Norway is Den Norske Bokklubben. It decided to use alkaline paper in all of its publications beginning in December 1988. Pressure exists to use paper not detrimental to the environment. The Paper Research Institute, the Ministry of the Environment, and other government bodies recognize the need to use permanent paper, when suitable, in reaction to requests from libraries and archives. They also want to use paper recycled and not prepared with chlorine whenever suitable. Normally, no laws would be passed pertaining to production and use of alkaline paper. There is simply a stated policy of the Ministry of the Environment. Norwegian GPO has been studying the problem and they are using permanent paper for some publications. GPO decides which paper to use. Progress in permanent paper use has been satisfactory to date, and it hasn't been considered necessary to involve the government directly.
Sweden	Specific regulations exist about archival paper. Although these require that the paper be 100% cotton, the paper is acidic from alum size. The National Archives, which sets policy of what is acceptable as archival paper, is considering whether to choose another producer, and that supplier would be providing alkaline paper. The National Archives of Sweden can instruct the government regarding what kind of paper to use. A law in effect since the beginning of the century states that the National Archives will determine what is archival. They have a law

stating that 10 copies of every government publication be on archival (i.e., rag) paper. This policy is now being revised. A reference group at the National Archives is discussing recommending alkaline paper for everything, but still keeping the requirement that ten copies on rag paper. Change will occur in August 1989.

Some mills produce alkaline paper. The two biggest mills are alkaline, but small ones are not. However, for sake of competition it is likely that several of the small ones will soon change to alkaline also. No legislation on permanent paper has been initiated in Sweden.

Swedish paper chemists are studying mechanisms of paper deterioration. For information contact Ingemar Froejd (Stockholm, Riksarkivet) Telephone: 011 468 737 6350; also: Samuelssen in Boraas; also, Brit Hedberg (head of responsible dept. at Natl. Archives), Riksarkivet, Box 12541, S-10229 Stockholm, Sweden. Telephone 46-8-7376440 or 46-8-7376350.

United Kingdom Some paper mills produce permanent paper. The British Library is promoting its use in the UK and also trying to get it placed on the library agenda of the European Commission. The National Preservation Office at the Library is arranging for the testing of a range of papers (both in recently published books and new paper) to be tested to determine how much is acid and how much alkaline. The government printer (HMSO) says 50% of the books published in UK are on acid-free paper and a number of large publishers are now using acid-free paper. There is no UK standard for permanent paper; they are waiting for the establishment of an ISO standard. There has been no legislative activity in the UK regarding permanent paper and its use.

Similar initiatives are underway in other countries. For example:

Canada There are now four mills from which Canadians can obtain alkaline paper.

Australia Work is underway on a permanent paper standard. Two paper companies currently product alkaline papers. Commonwealth and some State Governments are expressing interest in wider utilisation of alkaline paper and in paper from recycled fiber.

International Associations have also worked to advance the production and use of permanent paper.

International Federation of Library Associations and Institutions (IFLA)
At its annual conference in Paris, France (August 1989) three resolutions were adopted that urged the use of permanent paper, including by IFLA itself and by United Nations organizations.

International Publishers Association (IPA)
At its meeting in Frankfurt, FRG (October 1989) the association adopted a resolution urging its component national publishing associations to promote th use of permanent paper in books and other publications.

International Group of Scientific, Technical & Medical Publishers (STM)
This group has endorsed the resolution adopted by IPA.

International Standards Organization (ISO)
Technical Committee 46, Subcommittee 10, of ISO is working to develop an international standard for permanent paper based upon a revision of the U.S. standard ANSI Z39.48.

For more information: Merrily A. Smith

Mr. WISE. Thank you, Dr. Billington.

We've been joined by our colleague, Representative Williams of Montana. Knowing that you've got some other committee work, Pat, I would ask if you would like to take a seat at the table and if you'd like to make your statement at this time.

STATEMENT OF HON. PAT WILLIAMS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MONTANA

Mr. WILLIAMS. Thank you very much, Mr. Chairman. I appreciate your understanding in allowing me to move and I ask my colleagues forbearance while I do this.

Mr. Chairman, I find many organizations that support this resolution; none who oppose it. Perhaps that's because it costs nothing and in fact would save millions of dollars, not only for the Federal Government but for State and local governments, colleges, universities, archives, and libraries.

A book published on permanent paper today does not have to be deacidified or microfilmed tomorrow.

I particularly, Mr. Chairman, appreciate this committee hearing this resolution so early in the year. That will give us ample time to coordinate with the Committee on House Administration to which you know this resolution has also been referred.

In 1987, as chairman of the House Postsecondary Education Committee, I held a hearing on the problem of brittle books. We learned that the problem was more severe and extensive than we had imagined. Indeed, as Mr. Billington has suggested, this Nation's and the world's intellectual and culture heritage is, indeed, in jeopardy.

We learned in that hearing that educational institutions, especially the great research universities of this country, are facing an enormous and costly burden of salvaging as best they can literally millions of essential books and journals, either by processes of deacidification or by saving the content by transfering to other media such as microfilm.

The purpose of my resolution is preventative. Its purpose is to keep this problem from continuing by changing the use of acid-free permanent printing and writing papers, books, periodicals, and documents—papers with a life of hundreds of years.

By using permanent papers itself, the Federal Government would make a major contribution. In addition, encouraging the private sector, both profit and nonprofit, and State and local governments, would expedite the process already underway of changing to permanent papers.

Our example will also serve to encourage similar changes in other countries important to us in many ways, not the least of which is the fact that imported materials are a major component of our scientific and research libraries.

It is fortunate that the evolution of papermaking technology, spurred in part by concern for the environment, is on our side. Alkaline papermaking processes developed over the past quarter century are now cost-competitive with the older acidic processes, especially when environmental requirements must be considered.

Paper companies are steadily converting their printing and writing papermills to the alkaline process.

Much has happened, even in the few months since this resolution was introduced, which was March of last year.

For example, a representative of the U.S. producer of a fifth of our uncoated printing and writing paper testified before a House subcommittee last May that by 1991 all of its mills will have been converted to an alkaline process.

At the same time, more American publishers are specifying the use of alkaline papers for their books, and I think you'll hear more about that from another witness here today.

Again, Mr. Chairman, and my colleagues, I thank you very much for beginning this process early this year. Hopefully this will give us ample time to move ahead with what I believe and many of those who will testify before you today believe to be an important resolution.

Let's move ahead as quickly as we can and do what we can to save the intellectual and cultural heritage of this Nation and hopefully, by our example, of the world.

[The prepared statement of Mr. Williams follows:]

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Congress of the United States
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Washington, DC 20515

Statement of Rep. Pat Williams on H.J. Res. 226

I appreciate this opportunity to make a statement to the Subcommittee on House Joint Resolution 226, "To establish a national policy on permanent papers," which I have the honor to sponsor, along with 77 other members of the House. Attached to my prepared statement is a list of the co-sponsors.

I commend the Subcommittee for holding this hearing so early in the year, so that there will be ample time to coordinate the the Committee on House Administration, to which the measure has also been referred; bring it to the Floor; and secure the concurrence of the other body, which has passed a similar resolution.

The problem of the self-destruction of printing and writing papers used in books, other publications, and documents since the middle of the last century has been of concern to me in my capacity as Chairman of the Subcommittee on Postsecondary Education. In 1987, my Subcommittee held a hearing on the problem of "brittle books" in our nation's libraries and archives, and we learned that the problem was far more severe and extensive than we had imagined. Indeed, much of this nation's and the world's intellectual and cultural heritage was in jeopardy.

We learned that educational institutions, especially the great research universities of this country, are facing an enormous and costly burden of salvaging as best they can literally millions of essential books and journals, either by processes of deacidification, or by saving the content by transfer to other media such as microfilm. Either method is expensive both in staff time and in money for equipment and materials, and will require hundreds of millions of dollars to complete. Other witnesses such as the Librarian of Congress and the Archivist of the United States, are better qualified than I to discuss the extent and costs of this salvage operation.

The purpose of H.J. Res. 226 is preventative. Its purpose is to keep this problem from continuing by changing to the use of acid-free permanent printing and writing papers in books, periodicals and documents--papers with a life of hundreds of years. By using permanent papers itself, the Federal Government would make a major contribution. In addition, encouraging the private sector, both profit and nonprofit, and State and local governments, would expedite the process already underway of changing to permanent papers. Our example will also serve to encourage similar changes in other countries, important to us in many ways, not the least of which is the fact that imported materials are a major component of our scientific and research libraries.

It is extremely fortunate that the evolution of paper-making technology, spurred in part by concern for the environment, is on our side. Alkaline papermaking processes developed over the past quarter century are now cost-competitive with the older acidic processes, especially when environmental requirements must be considered. Paper companies are steadily converting their printing and writing paper mills to the alkaline process. Much has happened even in the few months since H.J. Res 226 was introduced in March of last year. For example, a representative of the U.S. producer of a fifth of our uncoated printing and writing paper testified before a House Subcommittee last May that by 1991 all of its mills will have been converted to an alkaline process. At the same time, more American publishers are specifying the use of alkaline papers for their books; you will hear more about this from another witness today.

In my experience in the House, this is a unique piece of legislation. Many organizations support it; none oppose it. It costs nothing; and, in fact, will eventually save millions not only for the Federal Government, but also for State and local governments, colleges and universities, libraries and archives. A book published on permanent paper today does not have to be deacidified or microfilmed tomorrow.

I thank you for this opportunity to appear before your Subcommittee in support of House Joint Resolution 226.

Mr. WISE. Thank you very much, Pat.

One question I have is that the resolution calls on several agencies with library functions to submit a report. There are other concerns that go beyond libraries.

What do you think about giving the reporting responsibility to the Library of Congress, the Government Printing Office, and perhaps the National Archives?

Mr. WILLIAMS. I'd be supportive of that, Mr. Chairman, if it's your judgment and the judgment of the committee that that might be a better coordinated way to proceed. I'd support that.

Mr. WISE. I greatly appreciate you taking the time to come. You're certainly welcome to stay if you like. We certainly wanted to hear from you. Thank you for your leadership on this. I believe I'm a cosponsor of this bill thanks to you.

At this point let's return to Dr. Don Wilson, Archivist of the United States. Dr. Wilson.

STATEMENT OF DR. DON W. WILSON, ARCHIVIST OF THE UNITED STATES

Dr. WILSON. Thank you, Mr. Chairman.

Mr. Chairman, I'd like to commend you and Congressman Williams for addressing this issue of paper preservation and the damaging impact of acidic paper on our intellectual heritage.

The legislation that you have before you today, H.J. Res. 226, is an important beginning for the establishment of a permanent papers policy for the Federal Government, a policy which should assure that our history will be preserved at a more reasonable cost to the American people.

We do, indeed, rise in support of this legislation as an agency with a vital interest in its passage.

The National Archives and Records Administration, the repository of Federal records judged to have enduring value, addresses the crisis of deteriorating paper records directly and daily. The approximately 3.25 billion paper documents held by the National Archives comprise a rich variety of irreplaceable records that bear witness to activities and operations of the Federal Government.

The vast majority of these papers are less than 100 years old. Already, though, they display the effects of poor paper quality and testify to the real and potential erosion of our national memory.

An excellent and very current example of this critical problem are the records of World War II.

During World War II, the Bureau of the Budget instructed Federal agencies to use inexpensive paper as an economy measure. Today, as the 50th anniversary of America's entry into the war approaches, many of these valuable records that were created on such paper are fragile and difficult to use.

Consequently, the National Archives now faces the monumental task of transferring these deteriorating records to a more stable medium at a total cost exceeding $71 million. The cost of preserving other records currently held by and being added to the Archives will require many more millions of dollars.

While the National Archives is a strong advocate of the measure under consideration, there are two important issues related to the implementation of this order to consider.

First, in order to require the use of acid-free permanent papers, appropriate standards and specifications must be developed that will be used in the procurement of paper for permanently valuable records and publications.

Second, agencies will have difficulty requiring the use of acid-free permanent paper for all permanently valuable records and publications because it is sometimes difficult to determine historical value at the moment a document is created.

I would like to briefly address both of these issues in light of this resolution.

Establishing standards for acid-free permanent papers that will meet the preservation concerns of the National Archives, the Library of Congress, and other repositories, is complicated.

The definition of "acid-free paper" is fairly clear; that is, paper with a neutral or alkaline pH.

A growing number of paper companies manufacture alkaline paper.

"Permanent," on the other hand, means different qualities to different groups.

In the paper industry, "permanent paper" is defined as a paper which remains physically and chemically stable over a period of time.

In the view of some, "permanent paper" therefore means alkaline paper.

Permanence, though a highly desirable property, does not guarantee that a particular paper is strong enough to survive continued use. Therefore, durablity, a paper's resistance to tearing, abrasion, breaking, other types of damage associated specifically with use, is a separate characteristic of paper. To archives and libraries, durability is a quality to be considered in evaluating any paper intended for permanent retention.

Several bodies have issued or drafted voluntary standards or guidelines on permanent paper, including the National Standards Institute, the American Society for Testing and Materials, and the International Standards Organization.

The establishment of paper standards is a formal consensus-building process that involves the representatives of the interested organizations, including industry and end users.

The most widely recognized standard for printed library materials was developed by the American National Standards Institute. The Congress' Joint Committee on Printing that establishes specifications for printing and writing papers purchased by Federal agencies, has recently issued a specification for uncoated permanent printing paper which is essentially the same as the ANSI standard. This is an important step because it provides a permanent paper that agencies can specify and industry can provide for printing permanently valuable publications for Federal agencies.

I've submitted copies of the standard and specification with my formal statement for the information of the committee.

However, permanently valuable Federal records are much more than just printed documents; thus, standards for acid-free perma-

nent paper will also need to address the many other types of paper on which permanent records may be created.

The National Archives and Records Administration urges that standards be developed not only for permanent paper for printing, but for other types of paper in use by agencies today; for example, computer paper and fax papers.

When the standards for permanent paper have been developed and adopted, they will form the basis for specifications set by the Joint Committee on Printing and the General Services Administration for the procurement of paper by all Federal agencies. Only then will Federal agencies be able to require the use of acid-free permanent paper for appropriate Federal documents.

As I noted earlier in my statement, the second issue relating to implementation of the joint resolution concerns the difficulty in determining which Federal documents must be created on acid-free permanent paper.

While certain categories of records are always designated as "permanent," it is not feasible to identify all permanently valuable Federal records at the time of their creation. Some records are not designated as "permanently valuable" until years later during the records scheduling process when it is determined that those records concern historically significant people, places, things, issues, or events that only can be determined with hindsight. For this reason, a strong case can be made to require the use of acid-free permanent papers for all Federal records.

While such a suggestion would have been economically infeasible several years ago, production of acid-free paper is increasing at such a rate that its cost is becoming competitive with acidic papers.

At least for printing and correspondence purposes, we may be at the point where requiring permanent paper be used for all records would not be out of the question. If we were able to accurately assess our long-term costs for treatment, for conservation, for duplication of Government records, it's conceivable that the change to permanent durable paper would be cost-effective even now.

In conclusion, the National Archives strongly supports the passage of H.J. Res. 226.

As part of implementation of the measure, we support development of expanded permanence standards for all of the many types of papers used to create Federal records.

We are prepared to take a very active role with the appropriate organizations in the development of the standards for permanent papers of all kinds.

As preservation of the written records of the Government of the United States is our responsibility, we urge that the quality of paper available to the agencies that create records be improved.

Mr. Chairman, I'd be happy to entertain any questions.

[The prepared statement of Dr. Wilson follows:]

STATEMENT OF DON W. WILSON
Archivist of the United States
Subcommittee on Government Information, Justice, and Agriculture
Committee on Government Operations
U.S. House of Representatives
February 21, 1990

Mr. Chairman, I want to commend the Subcommittee on Government Information, Justice, and Agriculture for addressing the issue of paper preservation and the damaging impact of acidic paper on our intellectual heritage. The legislation that you have before you today, House Joint Resolution 226, is an important beginning for the establishment of a permanent papers policy for the Federal Government, which should assure that our history will be preserved at a more reasonable cost to the American public.

Mr. Chairman, it is generally recognized and scientifically documented that the acidic papers in general use for books, other publications, and documents since the mid-nineteenth century disintegrate in a relatively short period of time. Permanent/durable alkaline papers have been manufactured for at least 60 years, but it wasn't until recently that costs for alkaline paper became competitive with costs for acidic paper. This resolution would be an important first step in directing the Federal establishment to make use of this technical advancement to preserve our documentary heritage.

Specifically, House Joint Resolution 226 would make it the policy of the United States that Federal records, books, and

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publications of enduring value be produced on acid free permanent papers. The resolution mandates that Federal agencies require the use of acid free permanent papers for publications of enduring value produced by the Government Printing Office or produced by Federal grant or contract. Other requirements include the use of archival quality acid free papers for permanently valuable Federal records and a leading role for the National Archives in assisting agencies on the matter of paper quality and assisting the Congress in monitoring the implementation of this important resolution.

Mr. Chairman, we rise in support of this legislation as an agency with a vital interest in its passage. The National Archives and Records Administration (NARA), the repository of Federal records judged to have enduring value, addresses the crisis of deteriorating paper records directly and daily. The approximately 3.25 billion paper documents held by the National Archives comprise census records, immigration records, citizen's petitions, correspondence files, tax assessments, engrossed laws, treaties, manuals, program files, policy statements, and much more that bear witness to activities and operations of the Federal Government.

The vast majority of these papers are less than 100 years old. Already, though, they display the effects of poor

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paper quality and testify to the real and potential erosion of our national memory. An excellent and very current example of this critical problem is the records of World War II.

During World War II, the Bureau of the Budget instructed Federal agencies to use inexpensive paper as an economy measure. Today, as the fiftieth anniversary of America's entry into the War approaches, many of these valuable records that were created on such paper are fragile and difficult to use. Consequently, the National Archives now faces the monumental task of transferring these deteriorating records to a more stable medium at a cost exceeding 871 million dollars. The cost of preserving other records currently held by and being added to the Archives will require many more millions of dollars.

Passage of House Joint Resolution 226 will be an important first step in turning the tide of deteriorating Federal records. If the records we are charged with saving begin their life by being inherently stable, then it follows that a greater proportion of our limited human and monetary resources can be devoted to preserving invaluable records that are already in need of conservation attention and

preserving the information in other deteriorating records through duplication or conversion to another medium.

While the National Archives is a strong advocate of the measure under consideration, there are two important issues related to its implementation to consider. First, in order to require the use of acid free permanent paper, appropriate standards and specifications must be developed that will be used in the procurement of paper for permanently valuable Federal records and publications. Second, agencies will have difficulty requiring the use of acid free permanent paper for all permanently valuable Federal records and publications since it is sometimes difficult to determine historical value at the moment a document is created. Events over time often dictate the value of records, events which cannot be known in advance.

Establishing standards for acid free permanent papers that will meet the preservation concerns of the National Archives, the Library of Congress, and other repositories is complicated. The definition of "acid free" paper is fairly clear (i.e., paper with a neutral or alkaline pH), and a growing number of paper companies manufacture alkaline paper. "Permanent," on the other hand, means different qualities to different groups. In the paper industry, permanent paper is defined as paper which remains physically and chemically stable over a period of time. In the view of

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some, "permanent" paper means alkaline paper. Permanence, though a highly desirable property, does not guarantee that a particular paper is strong enough to survive with continued use. Durability -- a paper's resistance to tearing, abrasion, breaking, or other types of damage associated specifically with use -- is a separate characteristic of paper. To archives and libraries, durability is a quality to be considered in evaluating any paper intended for permanent retention.

The recent implementation of an Environmental Protection Agency (EPA) regulation (40 CFR Part 250 - Guideline for Federal Procurement of Paper and Paper Products Containing Recovered Materials) requiring the Federal government to procure writing and printing papers that contain at least 50% recycled stock is a good illustration of the differences of opinion on the importance of the chemical properties of acidity versus the physical aspects of durability. When the EPA policy was first proposed, the National Archives expressed its concern that paper with at least 50% recycled material could not meet the physical performance qualities required in permanent papers. While the National Archives is very supportive of the goals associated with recycling, we know that the recycling process tends to modify the paper both chemically and physically. This may result in a paper that is inherently less permanent due to chemical changes in the cellulose, and less durable due to shorter paper fibers.

The recycling industry countered with arguments only concerning the acidity of paper and stated that they could produce permanent paper because they could produce acid-free paper. After an additional exchange of correspondence moved the debate to the physical properties of paper, the industry proposed to increase the thickness of a sheet of paper to offset the loss of durability which comes from the recycling process. While this could be an acceptable approach in some isolated applications, for book and journal publishers, archivists, and librarians, additional thickness of publications and documents would exacerbate already critical storage problems and increase costs associated with postage.

The EPA regulations were implemented in June 1989, with EPA acknowledging the "archival papers" issue, but once again pointing to the industry's ability to produce acid-free paper using recycled materials as evidence that they can produce papers acceptable to the archival and library communities. In answer to a letter of concern cosigned by the Archivist of the United States and the Librarian of Congress, the Administrator of EPA stated that in Section 250.13 (a) of the regulations, if agencies determine that papers containing recycled materials do not meet reasonable performance standards for permanence, those agencies can develop technical performance specifications that exclude these papers. While that provision does exist, individual

agencies do not have the incentive or the expertise to develop such standards or specifications on their own.

Several bodies have issued or drafted voluntary standards or guidelines on permanent paper, including the American National Standards Institute, the American Society for Testing and Materials, and the International Standards Organization. The establishment of paper standards is a formal consensus-building process that involves the representatives of the interested organizations, including industry and end users.

The most widely recognized standard for printed library materials was developed by the American National Standards Institute (ANSI) and is known as ANSI Z39.48-1984. The Congress's Joint Committee on Printing, that establishes specifications for printing and writing papers purchased by Federal agencies, has recently issued a specification (JCP A270) for uncoated permanent printing paper which is essentially the same as the ANSI standard. This is an important step because it provides a permanent paper that agencies can specify and industry can provide for printing permanently valuable publications for Federal agencies. I have attached copies of this standard and this specification for the information of the Committee.

Permanently valuable Federal records are much more than just printed documents; thus, standards for acid free permanent paper will also need to address the many other types of paper on which permanent records may be created. The National Archives and Records Administration urges that standards be developed not only for permanent paper for printing, but for permanent bond, ledger, and manifold papers, permanent carbon- and carbonless-copy paper, permanent index card stock, permanent printing papers of all kinds, permanent computer paper, permanent xerographic copier paper, and permanent fax paper.

When the standards for permanent papers have been developed and adopted, they will form the basis for specifications set by the Joint Committee on Printing (paper for printing and writing purposes) and the General Services Administration (all other paper uses) for the procurement of paper by all Federal agencies. Only then will Federal agencies be able to require the use of acid free permanent paper for appropriate Federal documents.

As I noted earlier in my statement, the second issue relating to implementation of the joint resolution concerns the difficulty in determining which Federal documents must be created on acid free permanent paper. While certain categories of records are always designated as permanent (e.g., records that document the establishment or continuing

legal basis of an agency, that document institutional functions, or that establish policy), it is not feasible to identify all permanently valuable Federal records at the time of their creation. Some records are not designated as permanently valuable until years later during the records scheduling process when it is determined that the records concern historically significant people, places, things, issues, or events. For this reason, a strong case can be made to require the use of acid-free permanent papers for all Federal records.

While such a suggestion would have been economically infeasible several years ago, production of acid-free paper is increasing at such a rate that its cost is becoming competitive with acidic papers. At least for printing and correspondence purposes, we may be at the point where requiring permanent paper be used for all records would not be out of the question. If we were able to accurately assess our long term costs for treatment, conservation, and duplication of government records, it is conceivable that the change to permanent durable paper would be cost effective now.

In conclusion, the National Archives strongly supports passage of HJR 226. As part of implementation of the measure, we support development of expanded permanence standards for all of the many types of papers used to create

Federal records. We are prepared to take a leading role with the appropriate organizations in development of these standards for permanent papers of all kinds. As preservation of the written records of the government of the United States is our responsibility, we urge that the quality of paper available to the agencies that create records be improved.

Mr. WISE. Thank you, Dr. Wilson.

Our final witness is Lawrence Hughes, chairman of the Association of American Publishers. Mr. Hughes.

STATEMENT OF LAWRENCE HUGHES, CHAIRMAN, ASSOCIATION OF AMERICAN PUBLISHERS

Mr. HUGHES. Mr. Wise and members of the subcommittee, thank you for giving me the opportunity to testify this morning.

As chairman of the Association of American Publishers, I speak on behalf of the AAP's more than 220 member publishers. AAP member houses, which are located in every part of the United States, are responsible for about 70 percent of the books published in this country. They publish all types of paperback and hardcover books for adults and children: poetry, fiction, general nonfiction, textbooks, medical books, professional, scholarly and scientific works, reference books and dictionaries, Bibles, art books, and journals.

Members of our association are acutely sensitive to the need to preserve our Nation's cultural and literary heritage and aware of the responsible role we must play in this effort.

Recent advances in electronic technology have not changed the basic reality that books are, and will remain, the primary repository of that heritage.

In May of last year, I had the honor of appearing before the House Subcommittee on Science, Research, and Technology to discuss the problem of book preservation. At that time I pledged the cooperation of the book publishing industry in the effort to have books and other publications of enduring value printed on paper that will withstand the ravages of time.

I stressed, however, that the success of such an effort would require the committment of paper manufacturers and suppliers to ensure the availability of adequate supplies of acid-free paper at competitive prices.

I noted at that time: "We believe that the key to a hundred percent use of acid-free paper is availability. If enough is being produced, there seems reason to believe that costs would be in line and that the book publishing business, which does prefer to use acid-free paper, would then use it all the time . . . I am told by experts that in 1991, perhaps even in 1990, sufficient acid-free paper will be available for books and all publishers of hard-cover volumes will be using acid-free paper."

Since the hearings last spring, our industry's commitment to the use of permanent paper has broadened.

In August 1989 a memorandum was sent to the heads of all AAP member houses reiterating the association's support for the use of acid-free paper and urging publishers who print their books on permanent paper to include a statement to that effect on the copyright page of each book.

I brought with me today a typical example of what is taking place in the book publishing industry.

Here is a book [indicating], a biography of the life of John Berryman: "Dream Song" by Paul Mariani, which was published in January of this year by one of the companies for which I am responsi-

ble. On the copyright page of that book there is included this message: "Recognizing the importance of preserving what has been written, it is the policy of William Morrow and Company, publishers of this book, and its imprints and affiliates, to have the books it publishes printed on acid-free paper and we exert our best efforts to that end."

That message or a similar message is being carried now in the books being published by almost every major—I would say every major publisher in the United States.

At the hearing last spring, paper manufacturers expressed confidence in their industry's ability to make high-quality acid-free paper available to book publishers at reasonable prices and in sufficient quantity.

Happily, their optimism was justified.

Virtually all publishers of hardcover trade books are now using acid-free paper to a large degree, many of them exclusively.

Howard Goldstein, vice president and production director of Simon & Schuster Consumer Group and one of the industry's preeminent book production experts, noted recently that a publisher would be hard-pressed to find a supply of acidic paper and would probably have to go to a nonstandard source to get it. He expressed the belief that by January 1991 there will be no hardcover books published by any major publisher which are not printed on acid-free paper.

In the winter of 1988 when interest in the commercial use of acid-free paper was gaining momentum, the Association of American Publishers undertook a survey of its membership to acertain to what extent acid-free paper was being used and for what types of books.

The results of that survey, to which 55 publishers, including our largest members, responded, indicated a strong trend toward the use of acid-free paper in the publication of hardcover books and quality paperbacks.

We plan, in the next few months, to re-survey the issue. And we would not be surprised to find a significant increase in permanent paper usage now that acid-free paper is in adequate supply.

I should point out that there are categories of books for which the use of acid-free paper is not appropriate.

Mass market paperbound books, the kind you find on racks at airports and in supermarkets, for example, are not printed on acid-free paper except in rare instances. However, this type of book has not been an area of primary concern with respect to preservation, since most masss market paperbacks are reprints of books previously published in hardcover. Those works of lasting merit originally published in mass market paperback format usually find their way into a later hardcover edition.

In concluding, I would like to emphasize that although the use of permanent paper in book publishing is well on its way to becoming universal, usage by my industry represents less than 1 percent of the total paper produced for communication in this country.

We support the principles behind a joint resolution calling for a national policy on the use of permanent paper but stress that in formulating such a policy we must involve all segments of our society, not just the book and library communities. A long-term, strate-

gic approach must be dveloped with care and will require clear and rational guidelines regarding what we want to preserve and what constitutes permanence.

We are gratified that congressional attention is now being focused on safeguarding our written legacy for future generations.

Thank you and I'd be happy to try and answer questions.

Mr. WISE. Thank you very much, Mr. Hughes.

I'll turn the questions first to Mr. Condit.

Mr. CONDIT. Mr. Chairman, I have no questions. I apologize for coming in late to the meeting. I had another.

Mr. WISE. We are delighted to have you, however.

Mr. Towns.

Mr. TOWNS. Mr. Chairman, I would just note that I have no questions but I would just commend by colleague and friend from Montana for this legislation and do plan to support it.

I also would like to thank our witnesses for coming today and sharing their views with us.

And to further thank you for holding this hearing to try and expedite this matter.

Thank you very much.

Mr. WISE. It's our intent to move as expedititiously as we can on this legislation. As has been noted, it has a joint referal and there are still some things that need to be worked out but I'm hopeful that we can move this quickly.

We also would like to extend an invitation to Congressman Williams to join the subcommittee and ask any questions. And I now turn to Pat to see if he has anything he'd like to ask.

Mr. WILLIAMS. Thank you, Mr. Chairman. I appreciate your willingness to include me today.

Mr. Hughes, Mr. Wilson noted a difference with which I think most who are interested in this issue are familiar and that is the matter of permanence and durability in paper. He propounded that there is a difference.

What can the industry do with regard to the second matter and that is durability? You spoke to, I think, very good movement by the industry toward permanent, that is, acid- free paper. Mr. Wilson notes the durability of paper is also an issue.

What consideration is the industry giving to that part of the problem?

Mr. HUGHES. Well, I think the question is one that we have to discuss and deal with the paper manufacturers. They've come a long way now in meeting demands, first started by librarians and authors and then through publishers to the people from whom we buy papers to produce alkaline papers.

Not all of those papers meet the ANSI standard which would allow one to use the infinity symbol which the ANSI has recommended, because that symbol should only properly be used when there are certain other qualities of durability and opacity to the paper.

I am not an expert but I believe that the present acid-free papers that are being produced have a good durability. And there remains a question whether that ANSI standard really is necessary.

It is my understanding that the ANSI is at this very moment reexamining their position.

Whether it's entirely necessary for a book of this nature, for example, which would go into a library, whether it would have that much usage over the years is questionable because it would only be the tear strength of that paper which would be the difference.

I'm not qualified to say.

It's probably well worth looking into. And I don't know what the cost effects would be. We tried to find that out and there seems to be a degree of uncertainty as to whether meeting this ANSI standard all the time now would cost more money. This isn't just a problem for publishers. It becomes a problem for the purchasers which include, of course, libraries and schools and people in general who wish to buy books at a reasonable price.

That's a long answer and it's not an exact one because I don't think we honestly know.

Mr. WILLIAMS. Finally, Mr. Chairman, if I may direct a question to Mr. Wilson on the same matter.

As I understand it from your testimony, Mr. Wilson, durability is a matter not only of chemical change but also of length of fibers within the paper. Perhaps that's the guiding principle in this matter of tear strength.

Does moving to acid-free paper alone not solve the problem that we're trying to take care of?

Do we also have to try to encourage paper that is durable; that is, not only not subject to chemical change but also having longer fibers?

Dr. WILSON. Well, Mr. Congressman, I believe we do have to address that issue. As indicated, permanent paper is commonly defined as being—the ability to retain its original chemical and physical properties during storage. But as my colleague noted, and would agree I would think, we hope that these more durable materials will be used. In extensive use it is the strength factor that we would want to be concerned about in a permanent paper definition so that it would not be the case that the paper would be deteriorating by use. If the paper was only sitting on the shelf for a long time, its permanent quality would be sufficient. But there is that other factor of durability we think is important to consider when use is involved.

Mr. WILLIAMS. Thanks, Mr. Chairman.

Mr. WISE. Thank you, Mr. Williams.

Ms. Ros-Lehtinen, do you have any questions?

Ms. ROS-LEHTINEN. None, thank you, Mr. Chairman.

Mr. WISE. I would just like to note I believe the Librarian of Congress has brought a book I think printed in 1896. If you just pick up the pages—and I will not—they start to flake away.

I might note that what I was reading was "History of All Nominating Conventions in 1896." Having been to a few more recently, I wished their records would dissolve even more rapidly. [Laughter.]

This brings up your second issue, Dr. Wilson, which is how do you designate something as historical or worth saving at the time? That's a very good question. I would suggest to you that anything that comes in from the House of Representatives is, of course, immediately classified as "historical" and must be preserved.

Dr. WILSON. Absolutely.

Mr. WISE. I thought we could get an consensus on that.

I have some questions, but in the interest of time what I would like to do is submit them to you in writing, if I might. Your answers will be made part of the record.

I would ask the other members of the subcommittee if you have any further questions?

[No response.]

Mr. WISE. If not, I thank you very, very much for coming and look forward to working with you on this legislation.

I declare this hearing adjourned.

[Whereupon, at 10:45 a.m., the subcommittee adjourned, to reconvene subject to the call of the Chair.]

APPENDIXES

APPENDIX 1.—RESPONSES TO ADDITIONAL QUESTIONS

A. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION

National Archives

Washington, DC 20408

APR 13 XX

Honorable Bob Wise
Chairman, Subcommittee on
Government Information,
Justice, Agriculture
Committee on Government Operations
House of Representatives
Washington, DC 20515

Dear Mr. Wise:

I have received your request to supplement the record of the recent hearings of the Subcommittee on Government Information, Justice, and Agriculture on H.J. Res. 226, to establish a national policy on permanent papers. The ten additional questions pertained to the archival administration of computerized materials.

I am happy to have the opportunity to provide information on this important area. I have placed a high priority on electronic records ever since I became Archivist of the United States. The answers to your questions are enclosed.

Sincerely,

Claudine Weiher

DON W. WILSON
Archivist of the United States

Enclosures

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Congressman Wise's Questions

1. To what extent have computerized record-keeping systems maintained by Federal agencies become the most coherent "central files" that must eventually be transferred to and preserved by the National Archives and Records Administration?

In 1987, NARA asked the National Academy of Public Administration (NAPA) to review the impact of computer technology on the historical record of the Federal Government. In the final report of this study, THE EFFECTS OF ELECTRONIC RECORDKEEPING ON THE HISTORICAL RECORD OF THE U.S. GOVERNMENT, January 1989, NAPA reported, "Paper or hard copy is still the dominant medium in the world of governmental policy formulation, program development, and decision making. That it will continue to be so for the next five to ten years is the view expressed by most senior policy officials, program managers, administrative directors, information resources managers, agency historians, and records management staff queried by the study team. Furthermore, electronic media are seldom used to make decisions or formulate policy -- though some policies result from data analyses." (p. 23)

2. Is access to electronic records maintained by Federal agencies subject to technological dependence on specific computer software and hardware systems? How would NARA know the extent to which this dependence exists? For example, does NARA know how many different word processing programs are currently being used by Federal agencies?

NARA continuously acquires knowledge of computer hardware and software being used by Federal agencies through our ongoing programs for scheduling, appraisal and accessioning of electronic records; through evaluations of agency records management programs; through archival research and evaluation studies; and through interactions with officials of other agencies in cooperative activities, in training programs offered by NARA, at conferences which we organize, and at government-wide and professional meetings, such as GSA's annual Information Resources Management (IRM) Conference, the Interagency Advisory Committee on IRM, the Information Resources Administration Councils, and the Association of Records Managers and Administrators. In addition, we obtained a great deal of in depth knowledge from the NAPA study of electronic recordkeeping. We are currently preparing to commission a supplemental study which will focus on data bases maintained by Federal agencies.

In general, we do not believe that access to the electronic records of Federal agencies is dependent on the specific computer

hardware or software used by the agencies to create or maintain those records. The two most predominant forms of electronic records are data files and word processing documents. In both categories, much of the software associated with the files is needed for creating files, updating information in them, assuring data quality, and producing specific outputs needed for current agency business. Such software is not needed for access to archival records. Access can be provided using standard hardware and generalized software.

NARA has almost two decades of experience in providing access to digital data files. None of the 8,000 data files we have accessioned is hardware dependent. Only 2% require special processing to access the records in them. This processing is needed to deal with the unusual or obsolete formats of these files; however, the software to accomplish the special processing can be created using high level computer languages, such as BASIC or COBOL. It is not necessary to preserve or have access to the operating system software or data base management system originally used to process the data in order to access the records.

The data files which NARA has accessioned to date reflect an older, simpler norm of data processing. The procedures used to provide access to these files are not adequate for the more complex data architectures which exist today. To overcome this limitation, the National Archives is developing a generalized capability to preserve and provide access to complex data bases. The data base management system to provide this capability is currently being tested.

NARA has not accessioned any significant volume of word processing files and, given the findings of the NAPA study, we do not anticipate that this will become a sizeable requirement for some years. When this does become a requirement, the basic need is for the National Archives to preserve the content of such records; it does not need to preserve the ability to edit the record. We do not believe it is important for NARA to know the variety of word processing software being used by agencies because virtually all word processing software has the capability of producing an ASCII version of any document. We are evaluating the adequacy of ASCII for preserving the content of electronic documents. In this evaluation, we are also considering standards such as Office Document Architecture, Office Document Interchange Format, Standard Generalized Markup Language, and Standard Page Description Language.

3. What role do maintenance and preservation of the different computer software and hardware systems used by Federal agencies play in NARA's efforts to preserve the electronic records of the Federal Government? What steps have been taken by NARA to

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address the maintenance and preservation of such hardware and software and related documentation? Please respond separately for the different categories of computers in use by the Federal government such as personal computers, minicomputers, mainframe computers, etc.

Preservation of records in electronic form makes sense only if computer processing of the records is essential or highly desirable. In the volatile world of computer technology, preserving original technical characteristics of such records would be tantamount to losing the ability to process the information using a computer. That approach would negate several of the benefits of preserving electronic records: the dense compaction of information, the ease of copying files or extracting portions of them, and the relatively economical distribution of large volumes of information.

In an archival perspective, which must address timeframes of 100 years and longer, preservation of hardware and software will be technologically and economically unfeasible. To try to preserve the original technology from the numerous and diverse agency systems which generate archivally valuable electronic records would create a demand for infinite resources.

The long term preservation of hardware in an operable state would entail several impossible requirements. It would require a cadre of highly skilled electronics engineers, systems programmers and systems operators, specially trained in each different computer architecture, not to mention make and model, to maintain and run each computer. It would also require a high technology version of antique reproduction workshops capable of manufacturing spare parts. Computer hardware has a very short lifespan in the marketplace. It is impossible, for example, to find today a commercial source for magnetic core, which was the standard computer memory as recently as twenty years ago.

Preservation of operating systems software depends on the preservation of the hardware to which the operating systems are tied. Applications level software in general is not bound to specific hardware or operating systems. This is especially true for software written in standard, non-proprietary languages. Unfortunately, what is generally true is often false in particular. Even standard languages evolve over time and there is not always complete downward compatibility in the newer versions. Major software houses often develop and sell unique, proprietary implementations of standard languages. Specific applications software is often designed to take maximum advantage of the specific hardware and operating system used by the agency for which the programs are written. Because of factors such as these, there is a high probability that software preserved in its original state will not run on the advanced computers of future generations.

3

The NAPA study of electronic recordkeeping reported, "[NARA] must take into account the heterogeneous multi-vendor world of technology. It must assume that there will be continuous change in hardware, software, media, formats, and communications systems." (p. 32) The only practical way of approaching technological obsolescence is to try to preserve record content and, when necessary, functionality, rather than the technology.

NARA's approach has been to preserve electronic records in a format capable of being read by any computer conforming to current standards, rather than to preserve the specific hardware or software used in creating them. In this way, we preserve the records, rather than the technology. If NARA were to follow the alternative approach of preserving electronic records with all original technical characteristics intact, we would become, in effect, a museum which people could visit to gain access to these records on the unique and obsolete systems on which they were created. By preserving the records in standard formats, we have the capability of providing copies or extracts of the records to anyone anywhere in the nation in formats which can be used on a wide variety of contemporary computers.

NARA preserves electronic records rather than computer technology by adopting standardized approaches. For physical preservation, we have copied all accessioned electronic records to a medium and in a recording format which are practical, cost effective and stable, in the sense that the medium, the format, and the equipment and software needed to write and read the files can be expected to last for a reasonable time. We also monitor the progress of computer storage technology so that we can migrate our holdings to newer media or formats as older standards approach obsolescence. Thus, in the last decade we have moved from preserving electronic records on computer tape recorded at 1600 characters per inch (CPI) to a standard of 6250 CPI. We anticipate moving to a new and more compact medium within the next few years. While NARA preserves electronic records on standard media, we could copy these records to a variety of different media if desired by researchers.

By using a standard medium for preservation and generic software tools for access, we obviate the need to preserve different computer hardware, software and related documentation. We also avoid the need to set up different procedures for preserving records generated on different categories of computers, such as personal computers, minicomputers and mainframes.

There probably will be cases where it is not possible to preserve functionality without preserving technology. In dealing with such cases, we will have to factor in the costs and complexity of preserving such non-standard records in determining whether the records have sufficient value to warrant preservation.

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4. Is the need for specialized software and hardware to support access to electronic records transferred by Federal agencies to NARA expected to increase in the future? How would NARA know if this is the case?

Given the general trends of computer technology and of its use in Federal agencies, NARA does expect an increasing need for the development of specialized software and hardware to support NARA's programs. However, we do not equate the need for specialized hardware and software with the need to preserve the technology originally used to create or maintain the records.

We foresee a need for specialized hardware and software to expand the National Archives ability to accession, preserve and provide access to the increasingly diverse forms of electronic records, e.g., spreadsheets, geographic information systems, expert systems, and object oriented programming. In expanding to deal with such diverse categories of computer applications, we believe that the most viable approach is to develop standardized or generalized procedures and systems for each category of application, rather than trying to preserve the specific hardware or software used to create or maintain a given body of electronic records.

Undoubtedly, there will be exceptional cases which cannot be accommodated under a standard approach. The most difficult cases are likely to involve applications software. Applications software sits on the top of the pyramid of hardware and software dependencies. Application programs depend upon programming languages which are themselves subject to evolutionary changes in their governing standards. For software written in standard languages (e.g., COBOL) to be genuinely portable between two computer systems, two criteria must be satisfied. First, the language compilers on each system must fully conform to the applicable standard; i.e., for the same source program, they each must yield application software which correctly interprets the standard. In this case, the two systems' versions of the application would produce identical results when used with the same data. Secondly, the application program cannot make use of any non-standard, vendor-proprietary language constructs. Non-standard language features offer no guarantee of consistent interpretation between two different compiler implementations. Application programs which fully conform to applicable language standards should prove relatively portable. When one or both the application software and the language compiler are non-conforming, problems will exist.

We have identified two instances where it becomes necessary to preserve application software: (1) when the software itself has evidential value for documenting policies, procedures, decisions,

etc. and (2) when the software is essential to the interpretation of the records' contents. If software is needed in order to document how an agency developed or implemented policy, the essential step is to preserve the source code for the software so that it is possible to analyze how it worked. It is not essential to preserve the ability to use the software on a computer.

The second category is likely to be more difficult. If the software is necessary to convey meaning to the records' content, it may be necessary to run the software to access the records. For example, geographic information systems (GIS) are typically used to produce maps. A GIS contains data and software which translates the data into cartographic formats. It is necessary to run the software to produce the cartographic displays. Such displays realize the information content which is virtual in the system, but which cannot be tapped without appropriate software.

NARA hopes to acquire a generic capability for producing cartographic images of GIS data, rather than face the need to preserve all the different GIS software versions used by Federal agencies. The National Archives GIS system must be capable of transforming numeric, image, name, boundary and feature data into cartographic form. This system must be able to accommodate a wide variety of GIS data accessioned from agencies. In most cases, however, it will not be necessary for the system to have the capacity to produce displays identical to those produced in the originating agency.

A second example in which software is necessary to interpretation of the records occurs when some of the data content of the record is actually an extension of the software, e.g., it is not pure data but provides instructions to the software regarding how to process the data. A specific example would be a financial model in the form of a LOTUS 1-2-3 worksheet. (Refer also to the answer to question 6.) The worksheet contains not only pure record data, but certain spreadsheet cells contain formulas which instruct the spreadsheet software how to calculate or otherwise derive the contents of those cells from other data in the spreadsheet. Other cells may contain "macro instructions" which are a programming language in their own right. These instructions direct the software in such things as migration through the spreadsheet, solicitation of user input, and alternate (conditional) processing of certain portions of the spreadsheet data.

Most archival electronic records are preserved because of the value of the information they contain, rather than as evidence of government activities. The essential, then, is to provide access to the information in ways which meet the needs of researchers who come to the National Archives, rather than which replicate outputs produced in the agency of origin. It would be a

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disservice to researchers in the future to limit their access to the capabilities of antique computer hardware or software.

The 1989 NAPA report focused on electronic records generated in office automation environments. Our proposed study of data bases will develop additional information on hardware and software dependencies of data applications.

At the start of this fiscal year, I transferred responsibility for appraisal of electronic records to the Center for Electronic Records in the Office of the National Archives. By concentrating technical resources in the Center, NARA is able to take fuller account of technological parameters in appraising the long term value of electronic records. This provides an organizational basis for continuously expanding and updating our knowledge of this area.

5. Are computer software programs (such as WordPerfect) and computer operating systems (such as DOS) used by Federal agencies considered to be records subject to the requirements of the Federal Records Act?

NARA considers commercially available software which is sold as a commodity or "off-the-shelf" product to be a tool used in the production or retrieval of records rather than a vessel which carries record content. These software products, such as WordPerfect and DOS, fail to satisfy one of the two criteria for agency records which the Supreme Court established in Department of Justice v. Tax Analysts; namely, that the agency be in control of the material.

6. Has NARA taken any steps to acquire the computer software, hardware, and related documentation that may be necessary to access the electronic records that have been transferred or will be transferred? Do licensing agreements governing use by Federal agencies of software developed by contractors or commercial vendors hinder transfer of electronic records or computer software to NARA? How would NARA know?

NARA has accessioned approximately 8,000 electronic files into the National Archives. NARA requires agencies to transfer electronic files in a form which is not hardware dependent. The accessioning process verifies that the files are adequately and accurately documented and determines whether they require supporting software. Only one file which we have accessioned requires specific supporting software. That file, the Computer Budget Game acquired from the National Economic Commission in March 1989, runs under LOTUS 1-2-3. In the short term, this is not a problem because LOTUS is so widespread. We are examining options for long term access to this file.

Since we have not attempted to acquire software from agencies, licensing agreements have not been a problem in accessioning electronic records. Nor has any agency cited a licensing agreement as a factor which would prevent the transfer of electronic records. From the information obtained from the originating agencies when they scheduled the records, we have no indication that any of the 600 distinct series of permanently valuable electronic records which have been scheduled to date require any proprietary software or special hardware for preservation or access.

Software licenses could pose serious problems in cases where software carries record content, as discussed in response to question number 4.

7. Does NARA have a formal program to preserve the computer hardware or software used at NARA to create electronic records?

NARA has only one series of electronic records scheduled as permanent. It is not dependent on any specific hardware or software.

8. Are Federal agencies taking sufficient measures to ensure that electronic records can be transferred to NARA in usable formats and with adequate documentation and supporting software? Has NARA issued any guidance or instructions to agencies? If so, please provide a copy.

While NARA has successfully accessioned thousands of electronic files with adequate and accurate documentation, there are frequent problems in obtaining sufficient documentation from the originating agencies. Additionally, there is independent evidence that agencies are not adequately managing their electronic records. For example, GAO recently released a report entitled, Space Operations: NASA Is Not Properly Safeguarding Valuable Data From Past Missions. This report documents extensive problems in managing, documenting and maintaining computer tapes. Inadequate management of electronic records is not limited to one agency. The NAPA study of electronic recordkeeping found that "There is a general lack of knowledge about, and interest in, recordkeeping in general." (p. C-2) Less than 10% of the 366 program officials who responded to the NAPA survey reported the issuance of directives covering electronic records. And only one program official reported that recordkeeping requirements are actually applied to electronic records. The low level of attention to the retention of valuable electronic records is also reflected in the Model Framework for Management Control Over Automated Information Systems jointly issued by the President's Council on Management Improvement and

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the President's Council on Integrity and Efficiency in January 1988. This report did not recognize that the Federal Records Act applies to automated information systems, and it did not include records retention and disposition in the model framework, except for records covered by the Privacy Act.

NARA has issued regulations covering electronic records at 36 CFR 1228.188 and 1234. A revision of the regulations at 36 CFR 1234 has been sent to the Office of Management and Budget for final review. I will send you a copy of the revision as soon as it is released for publication in the Federal Register. We are preparing for publication a handbook, Managing Electronic Records: An Instructional Guide. Copies of the current regulations and an advance copy of the handbook are attached.

9. Does NARA's Advisory Committee on Preservation include any members with expertise in computers? Is the Advisory Committee doing any relevant work on issues pertaining to software archiving issues? Please provide copies of any relevant materials.

The Advisory Committee on Preservation includes three members with expertise in computers: John C. Davis, National Security Agency, mass storage systems; Franklyn E. Dailey, Jr., consultant, information systems; and John C. Mallinson, University of California, magnetic recording technology. The Committee monitors NARA's progress in solving problems arising out of the growing use of computers in government; however, it is not engaged in any efforts specifically related to archiving software. In 1984, the Committee made a generic recommendation against preservation of digital records in machine-readable form. Dr. Robert Warner, then Archivist of the United States, decided against implementing that recommendation. The recommendation and the Archivist's response are attached under a cover memorandum from Norbert S. Baer, the Committee chair.

10. Would the development of hardware and/or software independent standards for electronic files assist NARA in preserving electronic records? Is NARA taking any actions to contribute toward the development of such standards?

The development and implementation of standards for electronic files would certainly assist NARA in preserving electronic records. In 1987, NARA signed an interagency agreement with the National Institute of Standards and Technology (NIST) to obtain the assistance of the National Computer Systems Laboratory in evaluating national and international standards for electronic records transfer and preservation, including standards applicable to data bases, text documents and technical documents containing

drawings, graphics and other content, in electronic form. We have recently completed our review of NIST's final report. As a result of this review, I have established an agenda for NARA in standards development and promotion, including continuing evaluation of emerging standards, collaboration with NIST, providing input to Open Systems Interconnection implementors workshops and other relevant standards implementors workshops, participation in the development of DOD's Computer-assisted Acquisition Logistics Systems, participation in ANSI standards development committees, and collaboration with state archives and professional archivists associations in promoting standards for electronic records.

Edgeworth Drive, Capitol Heights, MD 20743-3701). All audiovisual productions, including productions excluded from other reporting requirements of OMB Circular A-114, shall be reported on the SF 203. Interagency report control number 0152-NAR-AN has been assigned to this report in accordance with 41 CFR Part 201-45. The report is used to acquire data on Federal audiovisual activities, including overhead for in-house expenses. This information, when compiled, will be made available, upon request, to all agencies and to the public. Copies of SF 203 may be obtained from NAC. Agencies shall ensure, through management control and cost accounting systems, the accuracy and consistency of audiovisual production budget data provided to OMB and the SF 203 data furnished to NAC.

(4) *Evaluation.* Agency management should perform appropriate evaluation of audiovisual productions and include evaluation in audiovisual management control systems to ensure goals and objectives of the productions were met.

(i) Each agency shall develop an evaluation program to assess the value and effectiveness of its audiovisual productions.

(ii) The complexity and cost of evaluations should be commensurate to the cost and program impact of the audiovisual production being evaluated. Evaluation methods may range from a simple tally sheet to record sample responses to a more complex survey with interviews and testing forms.

(5) *Liaison.* Each agency shall forward the name, mailing address, and telephone number of the office which is assigned responsibility for management oversight of the agency's audiovisual activities to the Office of Federal Procurement Policy (OFPP), with an information copy to NAC (mailing address: National Audiovisual Center, National Archives and Records Administration, 8700 Edgeworth Drive, Capitol Heights, MD 20743-3701). These designated offices shall serve as the main point of contact for OFPP and NAC in all matters relating to Governmentwide audiovisual policies.

(6) *Stock footage.* Agencies, except the Department of Defense, shall offer to the Special Archives Division (NNS), NARA, motion picture outtakes, trims, and other unedited motion picture footage (with stock footage value) accumulated in the production of audiovisual products. The footage will be made available to other Federal agencies and the public through services provided by the Special Archives Division (mailing address: National Archives (NNS), Washington, DC 20408).

PART 1234—ADP RECORDS MANAGEMENT

Sec.
1234.1 Scope of part.
1234.2 Program requirements.
1234.4 Care, handling, and storage of magnetic computer tapes and portable disk packs.

AUTHORITY: 44 U.S.C. 2904 and 3101.

SOURCE: 50 FR 26939, June 28, 1985, unless otherwise noted.

§ 1234.1 Scope of part.

This part establishes requirements for agency records management programs for ADP records and standards for the care and handling of magnetic media to ensure the proper creation, maintenance, use and disposition of permanent ADP records and ADP records which have not been scheduled for disposition. Additional guidance about the care and handling of magnetic media should be requested from the Office of Records Administration, National Archives (NIA), Washington, DC 20408.

§ 1234.2 Program requirements.

Each Federal agency shall establish an appropriate program for the management of ADP records to include:

(a) Identifying the records to be used and maintained to document the ADP operation;

(b) Specifying the types of machine readable records created, together with the necessary classification, labeling, recording, and filing standards;

(c) Maintenance standards for the records used in ADP records management;

(d) Preserving machine-readable records through the use of proper media, storage facilities, and maintenance techniques;

(e) Following NARA and GSA guidance on the care and handling of diskettes (floppy disks);

(f) Scheduling the disposition of machine-readable records and the records used in ADP records management; and

(g) Issuing forms and formats for recording machine programs (instructions), functional and operational flow charts, record layouts, record coding structure (code books), printout plans, and basic machine run instructions (run books).

§ 1234.4 Care, handling, and storage of magnetic computer tapes and disk packs.

Magnetic computer media needs special handling to prevent the loss of information. The following standards should be observed in centralized computer rooms as well as decentralized computer support activities.

(a) Test and certify media no more than 6 months before using them to record information designated for permanent retention.

(b) When writing tapes, verify them as error free.

(c) Annually read a 3-percent statistical sample of all reels of tape to identify any loss of data and to discover its causes. If errors are detected, attempt to eliminate them and the causes of the errors. Replace tapes with 10 or more errors and, when possible, restore lost data.

(d) Ensure that information is not lost because of changing technology or deteriorating magnetic media by updating magnetic media to provide compatibility with the agency's hardware and software.

(e) Label magnetic media externally to include the name of the organizational unit responsible for the data; file title(s); dates of creation and coverage; the recording density; type of internal labels, if applicable; data set name(s), if applicable; volume serial number; number of tracks; character code/software dependency; record length; block size; and reel sequence number, if the file is part of a multireel set.

(f) Separate magnetic media containing permanent records from those containing temporary records.

(g) Maintain adequate and up-to-date technical documentation with the file. Minimum documentation is a narrative description of the file(s); physical file characteristics; recording mode information, including the coding structure (code books); recording system information; and a record layout. The record layout should break down the file by fields. Each field will have a name, size, starting position, and a description of the form of the data (alphabetic, zoned decimal, packed decimal, or numeric).

(h) Keep a duplicate copy of the data at an off-site location for security backup.

(i) Maintain the operating, storage, and test areas for computer magnetic media at the following recommended temperatures and relative humidities:

Constant Temperature—60° to 72 °F
Constant Relative Humidity—40% to 50%

(j) Allow only authorized personnel to enter storage libraries and computer rooms. Prohibit smoking, eating, and drinking in computer rooms, storage libraries, and rehabilitation areas, and keep them as clean as possible.

(k) Transfer the original or a duplicate copy of the file to the National Archives at the time specified in the records disposition schedule in accordance with instructions found in § 1228.188. Transfer may take place at an earlier date if convenient for both the agency and the National Archives.

PART 1236—VITAL RECORDS DURING AN EMERGENCY

Sec.
1236.1 Purpose.
1236.2 Background.
1236.4 Categories of vital records.
1236.6 Program considerations.
1236.8 Vital records storage at Federal records centers.

AUTHORITY: 44 U.S.C. 2104(a).

EDITORIAL NOTE: Nomenclature changes to Part 1236 appear at 50 FR 15725, 15726, Apr. 19, 1985.

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approval, and single printed or processed maps that have been attached to or interfiled with other documents of a record character or in any way made an integral part of a record.

(2) Master sets of printed or processed maps in the custody of the agency by which they were issued. Such master sets should be kept segregated from the stock of maps held for distribution and from maps received from other agencies. A master set should include one copy of each edition of a printed or processed map issued.

(3) Computer-related and computer-plotted maps that cannot be reproduced by the National Archives because of destruction of the magnetic tapes or other stored data or because of the unavailability of ADP equipment.

(4) Index maps, card indexes, lists, catalogs, or other finding aids that may be helpful in using the maps transferred.

(5) Records related to preparing, compiling, editing, or printing maps, such as manuscript field notebooks of surveys, triangulation and other geodetic computations, and project folders containing specifications to be followed and appraisals of source materials to be used.

(b) *Aerial photography and remote sensing imagery.* (1) Vertical and oblique negative aerial film, conventional aircraft.

(2) Annotated copy negatives, internegatives, rectified negatives, and glass plate negatives from vertical and oblique aerial film, conventional aircraft.

(3) Annotated prints from aerial film, conventional aircraft.

(4) Infrared, ultraviolet, multispectral (multiband), video, imagery radar, and related tapes, converted to a film base.

(5) Indexes and other finding aids in the form of photo mosaics, flight line indexes, coded grids, and coordinate grids.

(c) *Architectural and related engineering drawings.* (1) Design drawings, preliminary and presentation drawings, and models which document the evolution of the design of a building or structure.

(2) Master sets of drawings which document the condition of a building or structure in terms of its initial construction and subsequent alterations. This category includes final working drawings, "as-built" drawings, shop drawings, and repair and alteration drawings.

(3) Drawings of repetitive or standard details of one or more buildings or structures.

(4) "Measured" drawings of existing buildings and original or photocopies of drawings reviewed for approval.

(5) Related finding aids and specifications to be followed.

[42 FR 57315, Nov. 2, 1977. Redesignated at 50 FR 15723, Apr. 19, 1985.]

§ 1228.188 Machine-readable records.

(a) *Magnetic tape.* Computer magnetic tape is a fragile medium, highly susceptible to the generation of error by improper care and handling. To ensure that permanently valuable information stored on magnetic tape is preserved, Federal agencies should schedule files for disposition as soon as possible after the tapes are written. When NARA has determined that a file is worthy of preservation, the agency should transfer the file to the National Archives as soon as it becomes inactive or whenever the agency cannot provide proper care and handling of the tapes (see Part 1234 of this chapter) to guarantee the preservation of the information they contain. The tapes to be transferred to the National Archives shall be on one-half inch 7 or 9 track tape reels, written in ASCII or EBCDIC, with all extraneous control characters removed from the data (except record length indicators for variable length records, or marks designating a datum, word, field, block, or file), blocked no higher than 30,000 bytes per block, at 800, 1600, or 6250 bpi. The tapes on which the data are recorded shall be new or recertified tapes (see Part 1234 of this chapter) which have been passed over a tape cleaner before writing and shall be rewound under controlled tension.

(b) *Other magnetic media.* When a machine-readable file that has been designated for preservation by NARA is maintained on a direct access storage device, the file shall be written on new or recertified one-half inch 7 or 9 track tapes, written in ASCII or EBCDIC, with all extraneous control characters removed from the data (except record length indicators for variable length records, or marks designating a datum, word, field, block, or file), blocked no higher than 30,000 bytes per block, at 800, 1600, or 6250 bpi. This copy shall be transferred to the National Archives.

(c) *Documentation.* Documentation adequate for servicing and interpreting machine-readable records that have been designated for preservation by NARA shall be transferred with them. This documentation shall include, but not necessarily be limited to completed Standard Form 277, Computer Magnetic Tape File Properties, or its equivalent. Where it has been necessary to strip data of extraneous control characters (see paragraphs (a) and (b) of this section), the codebook specifications defining the data elements and their values must match the new format of the data. Guidelines for determining adequate documentation may be obtained from the Office of Records Administration (mailing address: National Archives (NI), Washington, DC 20408).

[50 FR 26935, June 28, 1985; 50 FR 27951, July 8, 1985.]

§ 1228.190 Transfer of records.

(a) *Policy.* Federal records will be transferred to the National Archives of the United States only if they are listed as permanent on an SF 115, Request for Records Disposition Authority approved by NARA since May 14, 1973, or if they are accretions (continuations of series already accessioned) to holdings of the National Archives. Transfers are initiated by submission of an SF 258, Request to Transfer, Approval and Receipt of Records to the National Archives of the United States.

(b) *Initiation of request to transfer—*(1) *Nonrecurring series scheduled for immediate transfer.* NARA will provide the SF 258 for records scheduled for immediate transfer on an SF 115 approved after September 30, 1987. NARA will send the SF 258 to the agency with the approved SF 115. The agency will sign and return the SF 258 to the Office of the National Archives (NN), National Archives and Records Administration, Washington, DC 20408, or to the appropriate National Archives Field Branch if so provided on the SF 115.

(2) *Future transfers of series in agency space.* Sixty days before the scheduled date of transfer to the National Archives of the United States, the transferring agency shall submit an SF 258 to the Office of the National Archives (NN) or to the appropriate National Archives Field Branch if so provided on the SF 115. NARA will determine whether specified restrictions are acceptable and whether adequate space and equipment are available.

(3) *Future transfers of series in Federal Records Centers.* NARA will initiate the SF 258 and send it to the agency 90 days before the scheduled transfer date. The agency shall approve or disapprove the SF 258 and send it to the address indicated on the form 60 days before the scheduled transfer date.

(c) *Physical and legal transfer.* The Office of the National Archives will provide shipping or delivery instructions to the agency or Federal Records Center. Legal custody of the records passes to NARA when the NARA official signs the SF 258 acknowledging receipt of the records.

[52 FR 34134, Sept. 9, 1987.]

§ 1228.194 Records subject to the Privacy Act of 1974.

Transfers of records constituting systems of records subject to the Privacy Act of 1974 (5 U.S.C. 552a) shall be accompanied by the most recent agency privacy notice covering the records.

[42 FR 57316, Nov. 2, 1977. Redesignated at 50 FR 15723, Apr. 19, 1985.]

§ 1228.196 Release of equipment.

Equipment received with the transfer of records to the National Archives will, when emptied, normally be retained by NARA or disposed of in accordance with applicable excess property regulations, unless the transferring agency requests its return.

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MANAGING ELECTRONIC RECORDS:

AN INSTRUCTIONAL GUIDE

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INTRODUCTION

The Federal Records Act (44 U.S.C. 3301) defines "records" as including "all books, papers, maps, photographs, machine readable materials or other documentary materials regardless of physical form or characteristics. . . ." Electronic, or machine readable, records are data in a form that can be read and processed by a computer and that satisfy the legal definition of a record.

At the most basic level, electronic records consist of binary digits (bits) that represent all data as some combination of ones and zeros. Standard code sets translate the bits into "alphabets" that computers can read. Two alphabets are common: the American Standard Code for Information Interchange (ASCII) and the Extended Binary Coded Decimal Interchange Code (EBCDIC).

Electronic records may include data files and data bases, machine readable indexes, word processing files, electronic spreadsheets, electronic mail and electronic messages, as well as other text or numeric information. Electronic recordkeeping involves the use of a computer to create, retrieve, analyze, transmit, or delete records.

Until the early 1980's, most data processing applications involved batch processing of data files on mainframe computers. Computer technology has advanced rapidly since then, leading to vastly increased capabilities for interactive processing and end user computing. Off-the-shelf data base management systems, fourth generation languages, and computer assisted software engineering have increased both programmer efficiency and user demand for computer support for agency missions. Today, Federal employees throughout Government are creating electronic records, aided by such office automation tools such as word processing, spreadsheets, electronic mail and messaging, and data base management software, all running on personal computers.

This handbook is addressed to the creators and users of electronic records, Information Resource Management (IRM) officials, ADP staff, and agency records managers. Unless otherwise noted, the guidance in this handbook applies to all electronic records systems, whether on micro-, mini- or mainframe computers, in networked or stand-alone configurations. It focuses on electronic records that are parts of automated information systems. It does not deal with data that are created in electronic form only as a means of producing hard copy documents, which are used to satisfy the agency's recordkeeping requirements.

Electronic data that are not part of an organized information system are usually outside the effective control of agency management. The agency should determine if significant amounts of electronic data are outside of management control and whether that is an appropriate situation. If the agency decides to establish systematic controls over such data, this handbook will be helpful.

This guide emphasizes the crucial role of records disposition in managing electronic records. Special attention is devoted to the application of General Records Schedules (GRS) to electronic records and the identification and transfer to NARA of permanently valuable electronic records. The handbook concludes with a brief review of some essential maintenance guidelines for electronic records. Appendices 1-5 provide additional detail on these subjects, while Appendix 6 defines the basic terms used in the guide.

RECORDKEEPING REQUIREMENTS

Automated information systems involve creating, altering, and deleting data. The procedures for controlling data input, and updating and deleting data, must be determined as a part of system design. They are determined primarily by ongoing needs for the conduct of current business. During the system design phase, the agency also needs to decide whether it has any need for any of the data beyond the conduct of current business. If so, it needs to define the nature and duration of such needs, and to adjust the system design accordingly. In short, the agency must establish recordkeeping requirements.

Establishing recordkeeping requirements for an information system requires, at a minimum, full and accurate documentation of the system: the functions supported by the system; the operational, legal, audit, oversight, or historical requirements for the information; how the information will be used, accessed, and maintained on each medium to meet these differing requirements; and the procedural controls employed to preserve the integrity of the data in the system. Technical documentation includes system architecture, data architecture, field definitions, record layouts, data element definitions, and code books identifying and interpreting all codes used to record data. Full, accurate, and current documentation of both the system and the data must be maintained until the information system is discontinued.

The information needed to establish recordkeeping requirements and

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retention periods for records can also serve as a catalyst for answering many management questions that should be addressed when designing or updating an information system:

- What is the system's purpose? Does it serve different purposes for different users? Do the different purposes entail different needs for retaining data?
- What inputs are needed and how long should they be retained? Are they needed for legal or audit purposes?
- How long does information need to be kept on-line? Are on-line retention requirements directly mapped onto unit records or data sets?
- If the agency no longer needs data on-line, does it need to retain it off-line? For how long?
- Can requirements for retention and disposition of data be integrated with systems design and operations, for example, with update procedures, regular backup operations, creation of history files, subset files and public use data sets, etc.?
- What will be done with all the reports, either on paper or computer output microfilm (COM) generated by the system?
- Are multiple copies of the data needed? If so, in what media? In what locations? Do all media need to be maintained for the same length of time? What will happen to the different media, and when? How will the integrity and authority of the data be assured?
- Is the system {sic} subject to the provisions of the Privacy Act? How do the Act's requirements for maintenance of timely, complete, relevant and accurate information affect the agency's estimate of how long data should be kept?
- Is the information in the system part of the agency's Vital Records program? If so, what provisions must be made to assure availability of the information in emergency situations?

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* Who is responsible for maintaining up-to-date, authoritative documentation of the system and the data it contains? Where will the documentation be maintained?

* Which medium containing the data must be given special care to ensure data preservation for long-term operational needs or for archival purposes?

What are Electronic Records?

For many individuals the threshold question to consider when establishing recordkeeping requirements is: **What is an electronic record?** Congress has defined Federal records in 44 U.S.C. 3301 to include

> . . . all books, papers, maps, photographs, machine readable materials, or other documentary materials, rtegardless of physical form or characteristics, made or received by an agency of the United States Government under Federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations or other activities of the Government or because of the informational value of data in them.

Therefore, electronically recorded data that meet both of the following conditions are records:

(1) they are made or received by an agency of the United States Government under Federal law or in connection with the transaction of public business; and

(2) they are preserved or appropriate for preservation as evidence of agency activiities or because of the value of the information they contain.

Clearly, this definition includes the information in automated "information systems" as defined by the Office of Management and Budget in Circular A-130. That document defines an information system as "the organized collection, processing, transmission, and dissemination of information in accordance with defined procedures, whether automated or manual." Such procedures are defined by the agency, not individual employees, in order to

ensure the creation and preservation of information related to official Government business.

It is also essential to emphasize that all components of electronic information systems are records: input, output, digital data stored in a variety of ways, and the related documentation. One essential recordkeeping requirement that the records scheduling process fulfills is determining how long to save these different record components of an information system.

The introduction of office automation products, particularly word processing, and the widespread distribution of microcomputers have raised the most difficult questions regarding record status. Most agencies have determined that word processing documents and other office automation documents must be printed on paper and placed in official files. In many of these cases, the electronic documents are regarded as nonrecord copies. In those cases when agencies choose to regard such electronic documents as records, NARA has issued disposition instructions in General Records Schedule 23 (see Appendix 2).

In most cases, the record status of electronic data will be apparent. When evaluating the occasional doubtful situation, the safest course is to regard it as a record. Staff of the National Archives are available to advise about the record status of electronic information, but the final decision rests with the head of each agency.

Judicial Use of Electronic Records

When effective recordkeeping requirements are implemented, computer based records pose no greater legal problems than do paper or microphotographic records, unless there are specific statutory or regulatory requirements for paper records. The Federal Rules of Evidence (Rule 803(8)) provide that official records may be admitted as evidence in lieu of the personal appearance of the official responsible for the activity.

Under this rule, if the only record is electronic, agencies should ensure that procedures are established and followed so that (1) the date of the record can be determined, (2) the date of any alterations will be automatically recorded by the system, and (3) it will be evident that the document was authorized to be issued ("signed") by an appropriate agency official. If these steps are not taken, the trustworthiness of the record could be questioned

and it could be refused as evidence. Contact your agency counsel for more specific advice.

Contractor Records

Increasingly, Federal agencies are using contractors to perform Congressionally mandated program functions. In these cases, contractors are likely to create electronic data that are necessary to provide adequate and proper documentation of these programs and to manage them effectively. To meet the requirements of 44 U.S.C. 3101, agencies must create and maintain records to document the contractor-operated programs. The best way to fulfill this obligation is to include in the contract a requirement for the delivery of all pertinent documentation of how the contractor carried out the program.

Many other types of contracts involve the creation of background data, often electronic, that may have reuse value to the Government. Whenever appropriate, agency officials should specify the delivery of such background data in addition to a final product. The following examples of electronic data that should be considered for delivery to the agency because of their reuse value are suggestive only:

(1) Background data to statistical analyses that a contractor creates may have further value to the creating agency, or to other agencies.

(2) Contracts to produce reports that represent Government policy should specify the delivery of background data needed to verify assertions or justify conclusions.

(3) Research contracts should specify the delivery of background data that have reuse value to the contracting agency or other Government agencies, in addition to a final report.

When specifying what background electronic data contractors should deliver to the agency, program and contracting officials should consult with agency records and information managers and historians to ensure that all long-term needs are met, particularly when the data relate to a new agency mission or program. It is essential to require the contractor to deliver sufficient technical documentation to permit the agency to use the data.

Deferred ordering and delivery of data clauses should be included in contracts whenever it is impossible to identify in advance all electronic data that should be delivered to the Government. The use of such clauses enables agency officials, after reviewing the final product of a contract, to acquire additional electronic data that may have reuse value to the Government. Alternatively, agency officials may require the contractor to prepare a data inventory, which could be used to identify data for deferred ordering and delivery as additional data requirements are identified.

ROLES AND RESPONSIBILITIES

The individual best equipped to answer many recordkeeping questions is the agency's records officer. This factor, and the imperatives of effective records and information management, argue strongly for the participation of records management officials in the design of information systems, and in major modifications of existing systems.

This involvement means analyzing information needs, information flows, and information controls, and resolving a variety of management questions. Potential benefits range from reducing the amount of paper records stored in offices and improving management of on-line disk space in the central computer facility to systematizing the life cycle of information within a system and within an agency.

Automating information systems tends to increase the amount of information to be managed, and to result in storing the same information on multiple media. To avoid unnecessary duplication, it is particularly important that records management officers help program officials and ADP officials to determine and agree on appropriate recordkeeping requirements as the information system is designed.

Effective management of electronic records demands coordination among three different groups within each agency: (1) those who create or use electronic records (information system managers), (2) those who purchase, manage, and operate computer and communications systems (informatiopn technology managers), and (3) the records managers responsible for ensuring the proper maintenance and disposition of the records. This coordination can be achieved by ensuring that these officials collaborate in performing the responsibilities listed below:

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Information System Manager

* Determines the information required to support the program or administrative function.

* Identifies and describes the applications supported by automated systems, i.e., their purpose, their information content, and the main stages through which the data flow.

* Develops and implements information system plans to meet agency needs.

* Determines how long the information is needed to support agency program and administrative operations.

* Identifies when information in the system affects legal rights and interests of the agency and of persons affected by agency decisions and actions.

* Notifies the records and information technology managers when planning new systems, new applications, or substantial modifications.

* Implements authorized disposition instructions for records in the system; provides for implementation of Privacy Act, FOIA, Paperwork Reduction Act, and other laws, regulations and directives concerning management of information resources.

* Performs regular reviews of the system's performance and conformity with legal requirements.

Information Technology Manager

* Manages agency computer and communication resources,

* Identifies all program and administrative activities which use or need computer and communications resources.

* Notifies the system manager and the records manager of technology changes that affect record access methods or the retention of data and records.

* Advises and assists in implementing authorized disposition instructions.

Records Manager

- Contributes to the development and review of plans for information systems and to the review of system implementation in order to assure that information needs of (i) the programs and activities which the system supports, (ii) other programs impacted by the system, and (iii) agency management are addressed and satisfied through comprehensive scheduling of the records in the system.

- Coordinates development of records schedules to assure that all required concurrences are obtained and to resolve conflicting requirements.

- Serves as the primary liaison to obtain approval of proposed disposition instructions from higher echelons within the agency, if necessary, and to obtain authorization from NARA.

- Advises agency officials, employees, and contractors on the development and implementation of records disposition instructions.

- Reviews existing information systems to ensure that disposition of records in the systems has been scheduled, to evaluate implementation of the schedule, and to identify problems requiring revision of the disposition instructions.

- Oversees implementation of disposition instructions.

- Ensures that records appraised as permanent by NARA are not destroyed by the agency and are transferred to the National Archives in accordance with disposition instructions in the records schedule.

Proper coordination of the various roles of these groups starts with a directive, issued by the agency head, that incorporates the guidance in this handbook.

DISPOSITION OF ELECTRONIC RECORDS: AN OVERVIEW

One of the most effective techniques for managing all records, including electronic records, is scheduling them for disposition. The term "disposition" means what happens to records when they are no longer needed for current Government business, and includes transfer to Federal records centers, transfer of permanent records to the National Archives, and disposal of temporary records.

Final disposition actions require the prior authorization of the Archivist of the United States. The document that provides authority for the disposition of records is known as a records schedule. A records schedule identifies records as either temporary or permanent. Temporary records are those the Archivist approves for disposal, either immediately or after a specified time or event. Permanent records are those the Archivist appraises as having sufficient value to warrant continued preservation by the Government as part of the National Archives of the United States.

The Archivist grants approval for disposal of temporary records common among agencies by issuing General Records Schedules. Additionally, all agencies maintain records which are not covered by any of the General Records Schedules. An agency must request approval for disposition of these records by submitting proposed schedules to the National Archives and Records Administration. The agency submits its proposal on a Standard Form 115, Request for Records Disposition Authority. The agency must also submit an SF 115 if it wants an exception from a disposition stipulated in any of the General Records Schedules.

The Office of Management and Budget (OMB) considers planning for records disposition so important that it requires agencies to

> Create or collect only that information necessary for the proper performance of agency functions and that has practical utility, and only after planning for its processing, transmission, dissemination, use, storage, and disposition. (OMB Circular A-130, 8.a.(1), emphasis added)

Unfortunately, life cycle planning for information systems often stops at implementation. In other cases, the life cycle is wrongly equated with the expected obsolescence of computer equipment. Both of these approaches fall short of dealing with the real life cycle of the information in the system, which includes creation, maintenance and use, and disposition.

Failure to address information needs comprehensively, that is, for the entire life cycle of the information, can have substantial negative consequences. Such consequences can include degradation of system performance because of accumulation of unneeded data; use of outdated information in decision making; compromised systems security and data integrity because of uncontrolled or improper deletion of records or data; and, inability to perform necessary audits or management reviews.

The scheduling process can serve as a test of how well other management objectives, such as sound planning and effective controls, are met. The very process of developing a records schedule and submitting it to NARA for review serves to verify how comprehensively and comprehensibly the agency has answered and documented basic questions about the purpose, functions, scope and organization of the system. Determination by NARA that data in an information system has enduring value and must not be destroyed provides an objective evaluation of the importance of the system. This assessment can supplement the agency's evaluation of its system on issues such as the appropriate levels and extent of controls over the system, resource allocation, and management oversight.

Inventorying and scheduling the information within a system are quite simply the most effective ways to ensure that an agency saves important data and deletes disposable data when no longer needed. Normally the first step in the disposition process for electronic records is to prepare an inventory of what information systems exist, what they do, and what information they contain.

INVENTORYING ELECTRONIC RECORDS

No organization can claim to manage any resource without accurate and comprehensive knowledge of what exists; how big it is; its scope; what purposes and functions it serves; who "owns" or controls it; who needs or uses it; and what legal, regulatory and other external requirements affect it. Collecting, aggregating, and maintaining this information about the information systems in an agency constitutes an information systems inventory. Such an inventory is the first step in the disposition process. Most agencies have inventoried one or more information systems, either in response to requirements of law or of central agencies, such as OMB and GSA, or simply as part of sound management of information resources.

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Within an agency there may be a number of sources for existing descriptions of electronic information systems. These descriptions may be found in one or more of the following places:

- IRM office. This office will have an inventory of the agency's major information systems or will know which organizational component has it. The IRM office may also maintain the agency's current master ADP plan, which may contain management overviews of the systems and identify the program office(s) supported by the information in the system.

- Agency clearance officer. If an agency collects information from the public, its clearance officer, sometimes assigned to the IRM office, will have documentation on requests for OMB clearance. This documentation will include the information's purpose, the legal authority for collecting it, the part of the public affected, the program officer's name, and the office originating the request. It may also include a justification of the system and a description of its inputs and outputs as well as its intended use.

- Interagency liaison officer. Sometimes assigned to the reports control office, this person should maintain a file of appplications to GSA for collecting information from other Federal agencies. This file has the same type of information as that maintained by the agency clearance officer (see above).

- Privacy Act coordinator. This person is responsible for publishing annual notices on systems of records containing information retrievable by personal identifiers. The systems may be either manual or electronic. The notices include the name of the system of records, the categories of individuals on whom records are kept, the use(s) made of the information, policies affecting the records, and the office responsible for the system.

- ADP facility. In most agencies with advanced computer applications, persons in the ADP facility will know which program activities are using ADP resources, what their purposes are, and perhaps which files are associated with those offices.

- Records schedule. Any references in the agency schedule to computer printouts or computer input documents usually indicate the existence of an electronic information system.

- Public information office. If an agency sells copies of computer files or statistical abstracts to the public, its public information office may have a catalog describing them. These public-use files are outputs from an information system.

- National Technical Information Service (NTIS), Department of Commerce. If an agency does not distribute computer files directly to the public, it may do so through NTIS. Files available from NTIS are outputs of agency information systems.

- Other sources may include the FOIA coordinator, the agency librarian, the agency historian, and program officers.

If the agency maintains a comprehensive inventory of its automated information systems, that inventory can be used as the basis for developing a records schedule for the information in automated systems. Otherwise, sources such as those described above can be used to compile an inventory for scheduling purposes. For electronic records that are not under the control of agency management, an inventory is the most comprehensive basis for developing a management framework.

A complete and accurate inventory of all agency electronic recordkeeping systems should include the elements indicated below. The elements with underlined titles are those NARA requires to make an initial appraisal of the information system. NARA Form 14028, Information System Description (Appendix 3), may be used to collect some of this information and furnish it to NARA as an attachement to an SF 115.

- Name of the system. Indicate the commonly used name and acronym of the system. For example, the Grain Monitoring System (GMS) or the State Energy Data System (SEDS).

- System control number. Specify the internal control number assigned to the system for reference, control, or cataloging purposes. For example, the information

system inventory number or the ADP plan control number.

- Agency program supported by the system. Show the agency program(s) or missions(s) to which the system relates. Also list the names, office addresses, and telephone numbers, and location of the program personnel who can provide additional information about the program and the system supporting it.

- Purpose of the system. Indicate the reasons for the system and the requirements met by it.

- Data input and sources. Describe the primary data input sources and the providers of the data to the system. For example, broadcast license holders or corporations doing business in the United States. Also give the names of any other systems, either inside or outside the agency, from which this information system receives data.

- Major outputs. Show the system's main products and the frequency of their preparation. For example, reports, tables, charts, graphic displays, catalogs, or correspondence--prepared weekly, monthly, or yearly. Also indicate whether the information is transferred to other systems.

- Information content. Indicate the main subject matter, date coverage, time span, geographic coverage, update cycle, and other major characteristics of the system. Also tell whether the system saves superseded information and whether it contains microdata or summary data.

- Hardware/software environment. Indicate the computer system manipulating this information and the software used. For example, IBM 38XX, COBOL application programs; DEC VAX 780, BASIS DBMS.

- System managers. List the name, office, telephone number, and location of the system manager or other system personnel who can provide more information about the system and the program it supports.

- Location of documentation needed to read and understand the files. Show where the codebooks and file layouts

are maintained. Indicate the office, room number, and name of the person having custody of them.

- Restrictions on access and use. Indicate national security, privacy, or other restrictions.

- Authorized disposition of the information as determined by the General Records Schedules or a NARA-approved SF 115. For example, 'Permanent." If not covered by a schedule, then indicate "Unscheduled" and recommend a disposition.

- Disposition authority citation. Give the records schedule and item number(s) covering the records contained in this system. Also cite any NARA-approved records schedule(s) and item number(s) authorizing disposition of system components, such as input forms, printouts, COM, and output reports.

- Location and volume of any storage media containing identical information. Show the location of any magnetic tapes or disks containing information identical to that in the system being inventoried. Also indicate the number of tapes and/or disks and their storage capacity.

- Identification of the person conducting the inventory. List that person's name, office, telephone number, and location.

- Date prepared. List the date the inventory was prepared.

APPLYING GENERAL RECORDS SCHEDULES

After conducting or compiling an inventory of electronic information systems, the records manager must determine whether the information in any system is covered by disposition instructions in the General Records Schedules (GRS) issued by NARA. A GRS describes temporary records that are common among Federal agencies, and authorizes their disposal without further clearance from NARA.

GRS 20, "Electronic Records," authorizes the disposal of electronic information that supports an agency's internal housekeeping activities and that is authorized for disposal in other media (e.g., paper, microfilm) by an item in another GRS. It also covers computer files that central data processing facilities create in the course of providing ADP services. These include most processing files, most computer system administrator's files, many files created from master files, and documentation relating to disposable master files or data base files.

GRS 23, "Records Common to Most Offices Within Agencies," covers electronic records produced in office automation applications. It authorizes the disposal of tracking and control files for disposable records, data bases developed on personal computers in support of administrative functions, and electronic word processing documents after hard copy is generated and filed. If word processing documents replace previously scheduled hard copy records, GRS 23 authorizes their disposal after the approved time for the hard copy.

Because of the differences in computer operating systems, in maintenance procedures, and in the administrative needs of agencies, the authorized disposal in these GRS for files that facilitate computer processing or duplicate data in official files is "delete when no longer needed." However, effective records disposition demands active participation by all concerned parties. Therefore, GRS 20 and the new items in GRS 23 should not be reissued verbatim as an agency directive. Instead, records officers, working with program and computer systems managers, should determine the specific time or event after which these records will be written off-line or destroyed and incorporate that disposition into the agency's records disposition manual and into each system's procedures.

Most agencies have decided to meet their recordkeeping requirements for documents that are created using word processing or electronic mail or messaging by printing those documents in hard copy. The success of this approach depends upon a clear understanding by all employees of the obligation to print and file all record material. In these cases, employees should be encouraged to destroy electronic versions of documents created by office automation applications as soon as hard copy documents are filed, unless they are needed for updating and reissuing. For restricted documents, especially those that are security classified, erasing the entire disk or tape is required to destroy

the records. The agency's information security officer can explain additional requirements for destroying security classifie electronic data.

The text of GRS 20 and the new items in GRS 23, with a discussion of what is and what is not covered by them, is in Appendix 2.

SCHEDULING RECORDS NOT COVERED BY THE GENERAL RECORDS SCHEDULES

Most agencies create large quantities of electronic records that are not covered by the General Records Schedules. Some of these program records have enough value to warrant permanent preservation in the National Archives. To obtain authorization for the disposition of such electronic records, an agency must submit an SF 115 to NARA. Detailed guidance on preparing an SF 115 and submitting it for approval is found in the NARA handbook, Disposition of Federal Records.

The information in each automated system should be scheduled in comprehensive fashion. That is, the schedule should take into account the data sets and files included in the system; hard copy inputs and outputs; the processing, subset, and special format files created and used in the system; and the documentation that describes and defines the system and the data in it. Disposition instructions should be established for each of these components, viewed in the context of the overall system.

Once the agency determines its own operational needs for retaining data in an automated information system, and identifies any additional legal requirements affecting disposition, the records officer is in a position to prepare an SF 115. The SF 115 should provide specific retention times for each system component, including inputs, on-line and off-line files, and all outputs, regardless of medium.

The disposition instructions should be specific enough to provide for different information needs within the agency. Any special legal requirements (e.g., concerning entitlement, or data on radioactive materials) should also be reflected in the proposed disposition. As outlined above, the proposed disposition must be coordinated with program offices supported by the information and ADP service units to ensure that people know when the information is no longer needed for programmatic purposes and what will happen to it.

In order to authorize disposition of electronic data, NARA needs to know what agency programs the information supports, the authorizing law or directive for the programs, what functions the information system performs, the sources of the data in the system, a brief description of the information in the system (the primary subject matter, time span, geographic coverage, update cycle, whether the system saves superseded information, and whether the system contains microdata or summary data), and what reports or other outputs the system produces. Other information requested about an automated system includes the commonly used name and acronym of the system, and citations to any previously approved disposition for any data in the system (see Appendix 3).

In collecting information for scheduling electronic records, technical documentation should be identified and reviewed to determine if it is sufficiently comprehensive and accurate to permit use of the data without reliance upon individuals who have specialized and extensive knowledge of the system. The documentation itself is a valuable record which should be retained for the life of the system. If NARA has appraised records in electronic form as permanently valuable, the documentation must be transferred to the National Archives together with the records.

Most electronic records do not have sufficient value to warrant permanent preservation in the National Archives of the United States. Records that do warrant continued preservation are those which provide documentation of substantive agency functions; contain important and unique information about people, places, things, or events (i.e., the universe in which the agency carries out its mission); and/or provide automated access to other permanent records.

If electronic records are proposed for permanent retention in the National Archives, the proposed disposition instructions should provide precise indication of what files will be transferred to the Archives and in what time frames. For example, if data is collected periodically, with separate data sets created for each period, the disposition instruction should stipulate appropriate file breaks, which delineate the data sets and specify when each data set should be transferred to the National Archives as in the following sample:

> Disposition: Yearly, create a new master file to record applications received after the end of the prior year. Close prior year master file after verification of final decision on all applications recorded in the file. Transfer prior

year master file to the National Archives three months after it is closed.

For an ongoing system, where agency information needs are not amenable to such periodic file breaks, the disposition instructions could link transfer of data to the National Archives with routine system update procedures, as in the following example:

> Disposition: Annually, copy records which have had no activity to history file and delete from master file. Transfer a copy of the annual history file to the National Archives immediately after it is created.
>
> Copy records from history file to current master file for any case where new transactions occur after the case record was migrated to the history file. Destroy agency copy of history file when one year old.

NARA appraises information in computer files using the same general standards it applies to information in any other media. However, NARA applies some special considerations when appraising information in automated information systems. Electronic information may have greater research utility than similar information stored on paper or microfilm because it can be manipulated. Consequently, some microdata appraised as disposable in hard copy (e.g., questionnaires) may be archivally valuable when maintained as electronic data. The potential research value of electronic records, especially statistical files, is enhanced if they can be linked because common indicators or delineators were used.

In some cases, future research value for statistical files is greater for microdata (data at the level collected) than aggregated data (e.g., county data compiled from township data). However, one cannot generalize that all microdata are more valuable than macro or aggregated data. If aggregate or macro data were used in formulating important government policies, the macro data could have important value in documenting the decision-making process. Moreover, some types of data may be permanently valuable in both micro and macro versions.

Another occasion when NARA might appraise two versions of the same electronic data files as permanent is when the original version includes restricted data and the agency also produced a disclosure-free, public use version. Preserving both the full

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records and the public use version would allow NARA to provide access to the unrestricted data in the records while privacy, security or other legitimate restrictions remain in force. To complete the appraisal of electronic records being considered for permanent retention, NARA is likely to need additional technical information. Information about the hardware and software used to record and manage the records, for example, may affect the appraisal. The dates and nature of system changes may affect disposition or transfer instructions. NARA also needs to know about relationships between files and about file structures, especially if the data cannot be put into a flat file format.

IDENTIFYING POTENTIALLY PERMANENT ELECTRONIC RECORDS

Given the enormous variety of information in computer files, it is impossible to compile a definitive list of potentially permanent electronic records. The following categories and examples are intended merely to suggest the variety. The examples are selected from electronic records already accessioned into the National Archives of the United States or scheduled as permanent records.

- Electronic records that replace records scheduled as permanent in another medium. An example is the State Department's Automated Document System of Central Foreign Policy Files, consisting of both an index for locating documents and the texts of telegrams, memoranda, and correspondence.

- Automated indices to permanent records. Examples include the automated index to the Department of Interior's microfilmed records relating to the Trust Territories for the Pacific Islands; the automated index to the correspondence files of the Secretary of the Air Force; an automated index to the microfilmed records of the Presidential Commission on the Space Shuttle Challenger Accident, and text files providing subject and full text access to affidavits, reports, and transcripts of hearings and meetings.

- Unique and important scientific and technical data resulting from observations of natural events or phenomena or from controlled laboratory or field experiments. Examples include data from NASA's Tektite I and II undersea living experiments in 1969 and 1970, data from the National Collaborative Perinatal Project, sponsored by

the National Institutes of Health, and the Environmental Protection Agency's (EPA) Pesticide Product Information data.

- Administrative data that have Government-wide coverage or significance. Examples include OPM's studies of Whistleblowing and the Federal Employee, 1980, and Survey of the Senior Executive Service, 1981; EEOC's Equal Employment Opportunity Surveys; and the Federal Awards Assistance Data System (FAADS), which contains quarterly data about Federal assistance to state, county, and local governments.

- Socioeconomic data on such topics as trade, education, health, or behavior. Examples include the Department of Education's National Evaluation of the Emergency School Aid Act, 1973-1976, the Office of Economic Opportunity's study of Poverty Neighborhoods in 105 Large Central Cities, 1970; the Bureau of the Census' Annual Import and Export Data Banks, 1964-, Census of Agriculture, 1949-, and Decennial Censuses of Population and Housing, 1940-; and EPA's Population at Risk System, containing data related to pollution and health.

- Natural resources data related to land, water, minerals, or wildlife. Examples include the Minerals Management Service's Mineral Availability System, containing types and locations of mineral deposits, and its Royalty Accounting Schedule, 1981; and the President's Commission on the Coal Industry's Survey of Community Conditions in Coal Producing Areas, 1979.

- Data that document military or civilian operations during times of war, civil emergency, or natural disaster. Examples include the President's Commission on the Accident at Three Mile Island's Study of Behavioral Effects, 1979; and the Joint Chiefs of Staff's Combat Activities File, containing data on flight operations flown in Southeast Asia from 1965 to 1970.

- Political or judicial data related to such topics as elections, special investigations, or court proceedings. Examples are the Immigration and Naturalization Service's Naturalizations File, 1971-; and the Bureau of Justice Statistics' Census of Juvenile Detention and Correctional Facilities.

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- Geographic data used to map the surface of the earth, other planetary bodies, or the atmosphere. An example is NOAA's Hydrographic Nautical Chart Data Base, 1970-.

- National security and international relations data that document such activities as strategic or foreign policy assessments, foreign public opinion, or international negotiations. An example is USIA's General Population Surveys of International Political Issues, 1972-.

These examples represent documentation of significant agency missions and programs. Records officers should give the highest possible priority to scheduling these kinds of electronic records and ensuring their timely transfer to the National Archives.

TRANSFER OF PERMANENT ELECTRONIC RECORDS TO THE NATIONAL ARCHIVES

Magnetic tape has a relatively short life span. Even under ideal conditions of controlled storage, a reel of tape is not expected to retain data in a readable state any longer than 10 years. There is also a significant probability that current computers will not be able to read a reel of tape that has been in storage for several years. For these reasons, agencies are encouraged to transfer a copy of permanent computer files directly into the National Archives of the United States as soon as possible. Although Federal records centers (FRCs) can provide proper environmental storage conditions for electronic media, they do not have specialized equipment to provide the maintenance needed to ensure the retention of data on magnetic tape.

NARA maintains permanent electronic records for subsequent use by the original agency, by other agencies, other organizations, researchers, and other members of the public. Generally NARA satisfies such demands by providing copies of files. Because of the multitude of computers available to present and future researchers, and the variety of software that will reside on them, NARA requires agencies to transfer permanent computer files in a hardware and software independent format. Specifically, files must be written on half inch magnetic tape in EBCDIC or ASCII, without internal control characters, on 7 or 9 track open-reel magnetic tape, recorded at 800, 1600, or 6250 bytes per inch, a blocked no higher than 30,000 bytes.

NARA currently does not accept electronic data stored on medium, such as floppy disks, tape cartridges, or optica

NARA's policy on the use of optical disks to store permanent records is summarized in NARA Bulletin 88-8, Use of Optical Disk Systems to Store Permanent Federal Records (see Appendix 4). Hardware and software independence ensures that if the sending agency ever needs a copy of the data file back from NARA, its computer facility will be able to write it to disk, regardless of the hardware or software on hand.

Like other secondary users of computer data, NARA requires certain documentation to accompany computer files. Technical documentation of the records, sufficient to support their use for secondary analysis, must accompany the tape. This documentation is described in the sections on inventorying and scheduling electronic records. NARA also needs specific information on how the tape was written, identification and definition of all data sets transferred, record layouts specifying relative positions, lengths and definitions of all data elements, and code books for all unique codes used in the records.

Details for transferring permanent computer files are in 36 CFR 1228.188, Transfer of Machine Readable Records to the National Archives (see Appendix 5). NARA will provide technical assistance in meeting these requirements or in resolving any transfer problems.

MAINTENANCE AND USE OF ELECTRONIC RECORDS

Certain basic records management principles apply to any record, whether in a file cabinet or on a computer disk. Records are valuable only if they can be found when needed for action or reference. To ensure that electronic records are available and accessible throughout their useful life, proper labeling, indexing, and preservation actions are imperative.

Labeling and Indexing Electronic Records.

Labels are vital for people who use electronic media. Labels on a floppy disk's paper jacket (external labels) should include the originating office symbol, title, begin and end dates, ~~what~~ software ~~was~~ used to create the records (e.g., LOTUS 123 or WORDSTAR), and ~~what~~ equipment it was produced ~~on~~? Labels on a computer magnetic tape should include the volume/serial number, the name of the program office sponsoring the data, and data set name(s). Identification of any access restrictions should be included on any external label.

Document, file, and directory naming conventions (internal labels) should be readily understandable and standardized so that authors and their colleagues or successors can find and use information stored on disks or tapes. Naming conventions are particularly useful when several people share a computer with a hard disk if the disk has not been partitioned into individual work directories.

Labeling, naming, and filing conventions should be simple. One effective system is to file like documents in the same place (on the same labeled floppy, in the same directory on a hard disk), which would avoid the necessity of rummaging through a drawer full of floppy disks or searching through multiple directories on a hard disk to find the needed document.

Indexing is a more complicated, though still relatively simple way to find electronic documents if a filing system is not used. An indexing system should require the document creator to indicate the name of the document, the addressee, the date, and the identifier of the disk it is stored on. An abstract of the document may also be useful. The index can be printed out, or stored on 3x5 cards or in a DBMS on a labeled floppy disk.

The need to establish a formal, office-wide system for filing, labeling, and naming electronic records depends on how the information is used. Such a system is an essential requirement if the office plans to maintain records solely in electronic form, without converting the information to paper or microforms. If there is a high turnover of personnel, or if information is shared or routed electronically, a formal system may be particularly advantageous. However, if information is shared on paper, minimal identifying information should be sufficient.

Media Care

A few common sense do's and don'ts must be observed when handling and caring for computer files and magnetic media. Additionally, special handling is needed to ensure the long-term preservation of electronic records. The first requirement is that file custodians know specifically which files are permanent, what is to be done with them, and when. This is even more important if computer files appraised as permanent are maintained in decentralized locations. The following maintenance suggestions are based on NARA's regulations on Electronic Records Management (see Appendix 1), which should be consulted for additional guidance.

For everybody:

1. Back up the files and documents on disks often. This is the single most important action users can take to ensure that the information they need will be available. Central computer facility staffs periodically perform system-wide backups. When users share a microcomputer, or have one on their desks, they must be encouraged to back up their files, preferably after every update. Keep a backup on the other side of a fire wall or in an off-site location.

2. Prohibit the use of floppy disks for the exlusive long-term storage of permanent records. Temporary storage of permanent records on floppy disks is acceptable, as is the use of them for reference purposes. Experience shows, however, that careless handling is much more likely with this medium than with magnetic tape, which is the recommended storage medium for permanent records.

3. Keep disk and tape drives clean and give them periodic preventative maintenance.

4. Keep disks and tapes away from strong electrical or magnetic fields.

5. Do not touch the recording surfaces of floppy disks, do not fold or bend them, and do not write on the paper jacket.

6. Do not allow unauthorized persons to have access to the computer or disk or tape files and documents. Even well-intentioned persons can enter commands that will delete files or reformat hard disks.

7. Keep food and drink away from storage media as well as equipment.

8. Store disks and tapes in a vertical position in a storage container.

9. Store floppy disks under normal office conditions, taking care to avoid extreme fluctuations of temperature or humidity.

For central files custodians (ADP facilities):

10. Store magnetic tapes in dust-free environments, at a constant temperature between 62 and 68 degrees Fahrenheit and at a constant humidity between 35 and 45 percent.

11. Annually read a statistical sample of all permanent and unscheduled data sets stored on magnetic tape to detect any loss of data.

12. Periodically rewind tapes at constant tension, at normal tape speed.

13. Copy data on the tapes to new or recertified tapes at least once every 10 years, or more frequently when necessary to prevent the physical loss of data or technological obsolescence of the medium.

For further technical information, see Sidney B. Geller, Care and Handling of Computer Magnetic Storage Media (NBS Special Publication 500-101), National Bureau of Standards, Institute for Computer Sciences and Technology, 1983.

FOR MORE INFORMATION

If you have questions about any of the information in this handbook, or if you have additional questions related to records management, contact your agency records officer or call the NARA offices listed below:

Agency Services Division, Records Administration Information Center, 724-1471, for information about the management of electronic records and for training in their maintenance and disposition.

Records Appraisal and Disposition Division, 724-1457, for questions concerning disposition, including the preparation of an SF 115 or the use of General Records Schedules.

Center for Electronic Records, 523-3267, for information about transferring permanent electronic records to the National Archives or for questions about electronic records already accessioned into the National Archives of the United States.

Office of Federal Records Centers, 653-8388, for questions about Federal records center storage of electronic records.

GENERAL RECORDS SCHEDULE 20

Electronic Records

This schedule applies to disposable electronic records routinely stored on magnetic media by Federal agencies in central data processing facilities, including ones operated for agencies by contractors. It covers records created by computer operators, programmers, analysts, and systems administrators in order to store and maintain computer files in such facilities; certain master files, including some that are components of data base management systems; and certain files created from master files for specific purposes. Items covering disposable electronic records produced by end users in office automation applications (e.g., word processing files, certain text files, and data bases developed on personal computers in support of administrative functions) are included in General Records Schedule 23, Records Common to Most Offices Within Agencies. GRS 20 and 23 do not cover all electronic records. Electronic records not covered by items in GRS 20 or GRS 23 may not be destroyed unless authorized by a Standard Form 115 that has been approved by the National Archives and Records Administration (NARA).

The records covered by several of the items in this schedule are authorized for erasure or deletion when no longer needed. NARA could not establish a more definite retention that would be appropriate in all applications. The agency should, when appropriate, determine a more specific disposition instruction, such as "Delete after X update cycles" or "Delete when X years old," for inclusion in its records disposition directives or manual. NARA approval is not needed to set retention periods for records authorized for destruction when no longer needed by the GRS.

Items 2a and 1a (in part) of this schedule apply to hard-copy or microform records used in conjunction with electronic files. Items 10 and 11 of this schedule should be applied to special purpose programs and documentation for disposable electronic records regardless of the medium in which such documentation and programs exist.

The text of the GRS items is followed by clarifications. For convenience, "GRS data" (or "records" or "files") refers to information authorized for disposal by a GRS. "Non-GRS data" (or "records" or "files") refers to information not authorized for

disposal by a GRS for which an SF 115 must be submitted.

1. Files/Records Created in Central ADP Facilities to Create, Use, and Maintain Master Files.

   a. Electronic files or records created solely to test system performance, such as test records, as well as related documentation for the electronic files/records.

      Delete/destroy when no longer needed.

   b. Electronic files or records used to create or update a master file, including, but not limited to, work files, valid transaction files, and intermediate input/output records.

      Delete after information has been transferred to the master file and verified.

   c. Electronic files created to monitor system usage, including, but not limited to, log-in files, password, files, audit trail files, system usage files, and cost-back files used to assess charges for system use.

      Delete when no longer needed in accordance with sound business practice and agency standard operating procedures.

Item 1 covers data in computer system files used to manage the computer system, such as test or diagnostic files, list files created during debugging routines; files used to update master files; and other files created by computer operations professionals to document activities on the system, control access to files or environments, monitor system usage to apportion costs or analyze capacity, etc. It authorizes disposal (erasure) of data in these files when no longer needed. It does not authorize disposal of the data in master files or data bases.

2. Input/Source Records.

   a. Non-electronic documents or forms designed and used solely to create, update, or modify the records in an electronic medium and not required for audit or legal

purposes (such as need for signatures) and not previously scheduled for permanent retention in a NARA-approved agency records schedule.

Destroy after the information has been converted to an electronic medium and verified, or when no longer needed to support the reconstruction of, or serve as the backup to, the master file, whichever is later.

Item 2.a. authorizes the immediate destruction of data collection forms, regardless of content, once the data have been entered into a computer file and verified, unless they need to be retained for legal, audit, or compelling operational purposes.

b. Electronic records, except as noted in item 2.c., entered into the system during an update process, and not required for audit and legal purposes.

Delete when data have been entered into the master file or data base and verified, or when no longer required to support reconstruction of, or serve as back-up to, a master file or data base, whichever is later.

Item 2.b. covers those computer files that are merged with the master file to make a new master file. Two examples are data entry on a remote microcomputer to upload to a master file on a larger computer, and a procurement office's transaction file of new orders received that is periodically merged into a master tape or disk file of procurement actions in progress. Such files are disposable after they have been merged into the master file and verified.

c. Electronic records received from another agency and used as input/ source records by the receiving agency, EXCLUDING records produced by another agency under the terms of an interagency agreement, or records created by another agency in response to the specific information needs of the receiving agency.

Delete when data have been entered into the master file or data base and verified, or when no longer needed to support reconstruction of, or serve as back up to, the master file or data base, whichever is later.

Item 2.c. authorizes disposal, after verification, of computer input files received from other agencies that are entered into a system operated by the receiving agency . It does not authorize disposal of computer files the receiving agency asked to have created. For example, if a program unit receives a copy of Census data that the Bureau of the Census routinely collects for itself, that file is covered by this item. Special surveys conducted under contract by the Bureau of the Census (or by a private sector company), information submitted under an interagency reporting requirement, and reports from the public cleared under the provisions of the Paperwork Reduction Act, are not authorized for disposal by this item. The distinction is between the receipt of existing data (which is covered by this GRS item) and the receipt of data specifically collected or created for the receiving agency (which must be scheduled for disposition on an SF 115).

d. Computer files or records containing uncalibrated and unvalidated digital or analog data collected during observation or measurement activities or research and development programs and used as input for a digital master file or data base.

Delete after the necessary data have been incorporated into a master file.

Item 2.d. authorizes disposal of remote sensing or scientific observation analog and digital data after its input to a master file or data base.

3. Master Files, (Including Master Files that are Components of Data Base Management Systems) Relating to Administrative Functions.

Master files that:

a) replace, in whole or in part, administrative records scheduled for disposal under one or more items in GRS 1-16, 18, 22, or 23; and

b) consist only of the same information as is contained in all or portions of the disposable records it replaces or duplicates;

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EXCLUDING those that replace or duplicate the following GRS items: GRS 1, Items 1, 21, 22, 25f; GRS 2, Item 17; GRS 12, Item 3; and GRS 18, Item 5.

Delete after the expiration of the retention period authorized for the disposable hard copy file or when no longer needed, whichever is later.

Item 3 covers computer files (except for the listed exceptions) that, when on paper, are GRS files, whether the paper-based system has been entirely or partially automated. These master files that replace paper files must be retained as long as the records they replace. This contrasts with data that support agency missions. When such data are automated, the agency must submit an SF 115 to schedule the electronic records.

It is vital that records officers distinguish between computer files that replace GRS paper (or microform, or other human-readable) files, and computer files that duplicate GRS human-readable files. This item covers computer files that replace GRS paper files as the official, legal record.

If computer files duplicate but do not replace GRS files, the computer files do not need to be retained as long as the official file. If an agency retains GRS information for the required period of time, on whatever medium it chooses, it is meeting its legal requirements. For example, maintaining payroll data on computer tapes as well as on COM for 56 years, without compelling operational requirements, is not necessary.

This item does not authorize the disposal of computer files that replace or duplicate information in GRS 1, items 1, 21, 22, 25f; GRS 2, item 17; GRS 12, item 3; or GRS 18, item 5. Such computer files must be scheduled separately on a SF 115.

4. Data Files Consisting of Summarized Information.

Records that contain summarized or aggregated information created by combining data elements or individual observations from a single master file or data base that is disposable under a GRS item or is authorized for deletion by a disposition job approved by NARA after January 1, 1988, EXCLUDING data files that are:

a) created as disclosure-free files to allow public access

to the data; or

b) created from a master file or data base that is unscheduled, that was scheduled as permanent but no longer exists, or can no longer be accessed;

which may not be destroyed before securing NARA approval.

Delete when no longer needed for current business.

Item 4 covers summary data files built from a single master file authorized for disposal under a GRS or by an approved agency records schedule. They are authorized for disposal when no longer needed for current business.

Disclosure-free summary files (created to permit public access to aggregated data, and usually associated with statistical surveys, reports, and analyses), and summaries of master files and data base files scheduled as permanent but now lost or damaged, are not covered by this item. These exclusions apply to structured data files created from a larger universe and kept for analysis and report generation, not to routine or ad-hoc queries of a DBMS, even if the queries produce summarized reports.

Summary files from master files NARA appraised as disposable before January 1, 1988, require the submission of an SF 115, UNLESS the summaries were included on an earlier SF 115 and specifically scheduled.

5. Records Consisting of Extracted Information.

Electronic files consisting solely of records extracted from a single master file or data base that is disposable under GRS 20 or approved for deletion by a NARA approved disposition job, EXCLUDING extracts that are:

a) produced as disclosure-free files to allow public access to the data; or

b) produced from a master file or data base that is unscheduled, or that was scheduled as permanent but no longer exists, or can no longer be accessed; or

c) produced by an extraction process which changes the informational content of the source master file or data

base;

which may not be destroyed before securing NARA approval. For print and technical reformat files see Items 6 and 7 respectively.

Delete when no longer needed for current business.

Item 5 authorizes the disposal of all extracts of master files that are scheduled as temporary either by the GRS or an approved agency SF 115. It includes extracts created when information is downloaded from a mainframe for processing on a microcomputer.

This item does not cover disclosure-free extract files, extracts from unscheduled master files and data base files, extracts from master files and data base files scheduled as permanent but now lost or damaged, or extracts that caused data changes in the master file. These exclusions apply to structured data files created from a larger universe and kept for analysis and report generation, not to routine or ad-hoc queries of a DBMS, even if the queries produce extracts or reports.

6. Print File.

Electronic file extracted from a master file or data base without changing it and used solely to produce hard-copy publications and/or printouts of tabulations, ledgers, registers, and reports.

Delete when no longer needed.

Item 6 authorizes the disposal of all extracted data used for publication or printing (or spooling) purposes when no longer needed. It does not authorize the disposal of the source file from which the data was extracted.

7. Technical Reformat File.

Electronic file consisting of data copied from a master file or data base for the specific purpose of information interchange and written with varying technical specifications, EXCLUDING files created for transfer to the National Archives.

Delete when no longer needed.

Item 7 covers both GRS and non-GRS files written to transmit data to another agency or to another computer. If an ADP facility keeps a copy of the file as insurance against loss in shipment, this item authorizes erasure of the retained copy when the file has been received, or in accordance with the ADP facility's standard procedures.

8. Security Backup File.

Electronic file consisting of data identical in physical format to a master file or data base and retained in case the master file or data base is damaged or inadvertently erased.

a. File identical to records scheduled for transfer to the National Archives.

Delete when the identical records have been transferred to the National Archives and successfully copied, or when replaced by a subsequent security backup file.

b. File identical to records authorized for disposal in a NARA-approved records schedule.

Delete when the identical records have been deleted, or when replaced by a subsequent security backup file.

Item 8 authorizes the erasure and reuse of backup disks or tapes when superseded by a later backup. It does not authorize the disposal of the files that are backed up.

Item 8.a. covers backups of files appraised as permanent. For files that are fixed, and not updated, one backup needs to be maintained in a readable format until after the file has been sent to NARA. Item 8.a. does not mean that all weekly backups of permanent files have to be kept until the agency sends NARA a copy. Permanent files will be identified in an agency-specific SF 115. The length of time an agency may need the file after a copy has been sent to NARA will vary widely. This item gives authority to delete the data from the computer system (either on- or off-line) after NARA has received it. It does not require immediate disposal if the file is needed for operating purposes.

Item 8.b. authorizes the disposal of these files in accordance with the computer facility's standard procedures.

9. Finding Aids (or indexes).

Electronic indexes, lists, registers, and other finding aids used only to provide access to records authorized for destruction by the GRS or a NARA approved SF 115, EXCLUDING records containing abstracts or other information that can be used as an information source apart from the related records.

Delete with related records or when no longer needed, whichever is later.

Item 9 covers most computerized finding aids to disposable records, as authorized by another GRS or by an agency-specific SF 115. For example, data in an electronic index to Requisitions for Equipment, Supplies, or Services (GSA Form 49) received in a procurement office is disposable by this item because the form itself is disposable under the GRS. In a more complex example, the correspondence subject file of an agency's public relations office is disposable under an agency-specific SF 115. The index to that file consists of nothing more than the name of the addressee, the letter number, the dates of the incoming letter and the reply, and the filing designation. In this case, the index would be disposable under this authority because it does not contain "abstracts or other information that can be used as an information source" apart from the correspondence subject file itself. However, if the index included an abstract of the incoming letter and a summary of the outgoing reply, then the index would be excluded from coverage by this item. Adding abstracts to the index changes its character so that it could be used as an information source about the contents of the incoming and outgoing correspondence. In this final example the index would not be covered by this item and would have to be scheduled separately.

10. Special Purpose Programs.

Application software necessary solely to use or maintain a master file or data base authorized for disposal in a GRS item or a NARA-approved records schedule, EXCLUDING special purpose software necessary to use or maintain any unscheduled master file or data base or any master file or data base

scheduled for transfer to the National Archives.

Delete when related master file or data base has been deleted.

Item 10 covers agency-written software used only to manipulate records scheduled for disposal by the GRS or approved agency records schedules. It does not cover off-the-shelf software, which is leased, not owned; the conditions for its disposition are in the lease agreement with the software vendor. Agency-written software supporting unscheduled or permanent files must be scheduled on a specific SF 115 along with the records it supports.

The exclusion to this item does not require agencies to maintain old COBOL programs after unscheduled data is moved to an ADA environment. Nor does it require agencies to continue to pay software maintenance for an old DBMS if database files are ported to a new DBMS, even if the programs manipulate unscheduled data or data scheduled to be transferred into the National Archives. However, if unscheduled or permanent computer files are not ported to the new software environment, and the files are maintained in a software-dependent format, the old software must be maintained so that the files may be usable until their authorized disposition. It may be simpler to maintain non-ported files in software independent formats.

11. Documentation.

Data systems specifications, file specifications, code books, record layouts, user guides, output specifications, and final reports (regardless of medium) relating to a master file or data base that has been authorized for disposal in a NARA-approved records schedule, EXCLUDING documentation relating to any unscheduled master file or data base or relating to any master file or data base scheduled for transfer to the National Archives.

Destroy or delete when superseded or obsolete, or upon authorized destruction of related master file or data base.

Documentation is the information needed to use computer files. File layouts, systems user manuals, report programs, input programs, etc., change as the software to manipulate data changes. Thus, moving from a batch, sequential file environment to an

interactive, DBMS environment will cause a change in documentation. Documentation that is current for each file needs to be maintained, but not outdated or superseded documentation.

The most current data systems specifications, user guides, report programs, and file layouts and code books that document GRS data or non-GRS data scheduled by a NARA-approved SF 115 in a tape file or in a DBMS, are authorized for disposal when the information system is discontinued, or the master file erased.

Documentation providing file layouts and code translations (code books) to permanent files must accompany the files [using a SF 277 (in part F)] when they are transferred to NARA.

[NOTE: See item 1a of this schedule for documentation relating to system testing.]

GENERAL RECORDS SCHEDULE 23

Records Common to Most Offices Within Agencies

This schedule provides for the disposal of certain records common to most offices in Federal agencies. It covers administrative subject files; facilitative records such as suspense files, tracking and control records, calendars, and indexes; and transitory documents; as well as certain types of records created in electronic form on stand-alone or networked micro- and mini-computers. Six items in GRS 23 apply to office automation applications running on stand-alone or networked micro-computers or in individual user environments on central computers. These six items are listed below, with clarifications following the text of the items.

2. Word Processing Files.

Documents such as letters, messages, memoranda, reports, handbooks, directives, and manuals recorded on electronic media such as hard disks or floppy diskettes:

a. When used to produce hard copy which is maintained in organized files.

Delete when no longer needed to create a hard copy.

b. When maintained only in electronic form, and duplicate the information in and take the place of records that would otherwise be maintained in hard copy providing that the hard copy has been authorized for destruction by the GRS or a NARA-approved SF 115.

Delete after the expiration of the retention period authorized for the hard copy by the GRS or a NARA-approved SF 115.

The distinction between computer files that are used to produce official human-readable files and computer files that replace such files must be kept clear.

If the computer is used to produce paper that is maintained in official files, the computer files/documents that created the paper are disposable when no longer needed, regardless of the authorized disposition of the paper, and regardless of whether the paper has been scheduled for disposition. The mechanics of disposing of old documents on disk will vary among computers, and among office environments. Regardless of how disposal is effected, consideration should be given to keeping a copy of those documents which are periodically revised and reissued (e.g., procedures manuals, directives, standard paragraphs, and spreadsheet models) to prevent rekeying a long document to incorporate a few changes.

2.b. If electronic documents are the record copy (i.e., when an office goes "paperless"), disposition authority for the paper documents applies to the electronic documents, whether by authority of a GRS or an agency schedule. If a body of records was disposable in two years when in paper, it must be maintained for two years when it exists only on a computer disk.

3. Administrative Data Bases.

Data bases that support administrative or housekeeping functions, containing information derived from hard copy records authorized for destruction by the GRS or a NARA-approved SF 115, if the hard copy records are maintained in

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organized files.

Delete information in the data base when no longer needed.

If the administrative or housekeeping information maintained in hard copy files is disposable, the data derived from them in the data base is also disposable.

4. Electronic Spreadsheets.

Spreadsheets that are recorded on electronic media such as hard disks or floppy diskettes:

a. When used to produce hard copy which is maintained in organized files.

Delete when no longer needed to update or produce hard copy.

b. When maintained only in electronic form.

Delete after the expiration of the retention period authorized for the hard copy by the GRS or a NARA-approved SF 115. If the electronic version replaces hard copy records with differing retention periods, and agency software does not readily permit selective deletion, delete after the longest retention period has expired.

See the comments for GRS 23, item 2, p. 20. The distinction between computer files that are used to produce official hard copy files and computer files that replace such files is vital. Users should maintain an electronic copy of spreadsheet models that are reused until they are no longer needed in order to preclude rekeying the entire spreadsheet.

5. Schedules of Daily Activities.

Calendars, appointment books, schedules, logs, diaries, and other records documenting meetings, appointments, telephone calls, trips, visits, and other activities by Federal employees while serving in an official capacity, created and maintained in hard copy or electronic form, EXCLUDING

materials determined to be personal.

a. Records containing substantive information relating to official activities, the substance of which has not been incorporated into official files, EXCLUDING records relating to the official activities of high government officials (see note).

Destroy or delete when 2 years old.

[NOTE: High level officials include the heads of departments and independent agencies, their deputies and assistants; the heads of program offices and staff offices including assistant secretaries, administrators, and commissioners; directors of offices, bureaus, or equivalent; principal regional officials; staff assistants to those aforementioned officials, such as special assistants, confidential assistants, and administrative assistants; and career Federal employees, political appointees, and officers of the Armed Forces serving in equivalent or comparable positions. Unique substantive records relating to the activities of these individuals must be scheduled by submission of an SF 115 to NARA.]

b. Records documenting routine activities containing no substantive information and records containing substantive information, the substance of which has been incorporated into organized files.

Destroy or delete when no longer needed.

Agencies using electronic calendar modules of OA packages should decide formally how long calendar information will remain on disk, since these data tend to occupy a lot of disk space. Agencies that determine that paper is the official file medium for documentation purposes should print the calendars periodically and file the paper for the requisite time to free disk space for other uses. The mechanics of this will need to be discussed with the calendar system manager, and incorporated into the computer system and office file systems.

8. Tracking and Control Records.

Logs, registers, and other records in hard copy or electronic form used to control or document the status of correspondence, reports, or other records that are authorized

for destruction by the GRS or a NARA-approved SF 115.

Destroy when no longer needed.

9. Finding Aids (or indexes).

Indexes, lists, registers, and other finding aids in hard copy or electronic form used only to provide access to records authorized for destruction by the GRS or a NARA-approved SF 115, EXCLUDING records containing abstracts or other information that can be used as an information source apart from the related records.

Destroy or delete with the related records or sooner if no longer needed.

Items 8 and 9 cover information in any medium (whether 3x5 cards or data on disk in a DBMS, e.g., "electronic tickler files") used to track GRS records and records disposable under the authority of an agency-specific SF 115, and indexes or other findings aids to disposable correspondence and other series of records in an office.

See the discussion for GRS 20, item 9, above. In both cases, the determining test is the amount and type of information in the index or tracking file.

B. LIBRARY OF CONGRESS

THE LIBRARIAN OF CONGRESS

WASHINGTON D.C. 20540

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MAY 3 1990

Government Information, Justice and Agriculture Subcommittee

April 30, 1990

Dear Mr. Wise:

Thank you for the opportunity to provide additional information about the Library's new Machine-Readable Collections Reading Room (MRCRR) and our activities with machine-readable materials. In addition to answering each of your questions, we are forwarding a copy of the pilot programs report of the accomplishments of the MRCRR during its first year of service, together with other materials prepared for use in the reading room and a few of the articles that have been written about it. We would be happy to answer any additional questions you might have concerning this room. You and your staff have an open invitation to visit the room at any time and see its operations firsthand.

Sincerely,

James H. Billington
The Librarian of Congress

Enclosures

The Honorable
Robert E. Wise, Jr.
Chairman
Subcommittee on Government Information,
Justice, and Agriculture
Committee on Government Operations
U.S. House of Representatives
Washington, D.C. 20515

1. What are the goals of the Library's Machine-Readable Collections?

The Library established the Machine-Readable Collections Reading Room (MRCRR)in July 1988 to provide research access to microcomputer programs and datafiles issued on disks.

During the Pilot Program for the MRCRR from July 1988 through June 1989, we had the following goals:

- To determine the best methods for acquiring machine-readable materials for the Library's collections
- To provide access for research purposes to the Library's collection of machine-readable materials
- To suggest service locations for machine-readable materials
- To develop procedures for cataloging machine-readable materials

Current goals in place since July 1989, are as follows:

- To continue to provide research access to the collection
- To build a collection of current and retrospective materials
- To serve as a resource for the Library and its patrons in identifying and utilizing machine-readable materials
- To monitor microcomputer hardware and software industries to identify trends that could affect collections development and reference service

2. a. What types of computer software, computer operating systems, and electronic information are sought for the collection?

We are collecting materials prepared for the general commercial market or materials intended for a major general audience. These include:

- Executable microcomputer software programs for IBM, Mcintosh, and other commercially prepared formats
- Datafiles issued on microcomputer, CD-ROM, or video disks
- Books accompanied by disks. Periodicals accompanied by disks or issued on disks

- DOS, OS, and other microcomputer operating systems will be collected for use with specific programs. New systems will be acquired as they come on the market.

- In general, materials prepared for the general market or for major markets will be sought but not materials that are highly machine-specific or prepared for a narrow or restricted audience such as the Postal Service or the Defense Department.

b. What types of machine-readable materials fall outside the scope of the collection?

- Clinical medicine - National Library of Medicine

- Technical Agriculture - National Agriculture Library

- Materials prepared for minicomputers or for mainframe computers

c. What criteria are used in selecting material for the collections?

- There is a draft LC Acquisitions Policy Statement for Machine-Readable Materials which we expect to put in final form within the next few months.

- We are also using LC Selection Policies for print materials as guidelines, and these are being reviewed for expansion to include products created with new technologies (e.g. educational programs for K-12, recreational products).

d. Is the Library preserving documentation for computer software as well?

- Yes, using machine-readable materials without manuals is difficult if not impossible. Whereas printed manuals and other documentation are sometimes all that is needed to answer a question.

3. a. What plans are being made for permanent preservation of magnetic tapes, diskettes, and other electronic data storage media being collected?

- Long-term preservation is our next major area to be addressed. Current literature and research indicate that tapes or disks can be expected to remain stable for about 7 to 10 years. We have begun to identify possible means for permanent storage such as CD-ROM.

b. What measures are anticipated to ensure long-term operability?

- We expect to maintain a selection of basic hardware for operation, and are beginning discussions with National Archives, Computer Section of Smithsonian, and Computer Museum (Boston) for future cooperation to ensure that appropriate hardware is available.

4. a. To what extent does the Library expect to maintain and preserve various types and generations of computer hardware?

- We expect to maintain equipment necessary to operate major formats such as IBM and Macintosh as well as other equipment necessary for other formats as is practical.

b. Is the Library only interested in materials accessible with a personal computer, or do plans call for retaining materials requiring mainframes, minicomputers, or specialized data base machines?

- At present, we are concentrating on microcomputer materials only. In the U. S., there are approximately 40,000 microcomputer programs, 600 CD-ROM informational publications, and less than 100 informational video disk publications currently available. These items are available from more than 8,000 publishers. We believe that body of material should be organized and controlled before moving into software for larger machines. The Charles Babbage Institute at the University of Minnesota is documenting mainframe and minicomputer operations as is the Computer Museum (Boston). We are beginning communication with them as well as Smithsonian and National Archives to promote comprehensive coverage without needless duplication.

c. Does the Library undertake any conversion activities to simplify access and preservation of materials collected?

Software

- We would not expect to alter software programs as they are published. We believe that conversions would be outside the scope of historical accuracy and would not want to modify a program from its original design.

CD-ROM Publications

- We are trying to identify means of simplifying user access to informational datafiles published on CD-ROM disks. Uniform access is needed for use of these publications by the public in reading rooms.

Preservation

- As previously stated, we have begun to examine various means for long-term preservation.

5. a. Are there any other Library collections or programs that seek to preserve computer software or information in electronic formats?

Software

- The Machine-Readable Collections Reading Room is the only LC operation which is preserving commercially prepared microcomputer software. The MRCRR is also preserving information in electronic formats (i.e. CD-ROM and video disk publications). Several other LC reading rooms are making CD-ROM publications available for general use on public workstations.

Electronic Publishing and Files

- The Congressional Research Service is moving forward with use of the Optical Disk equipment for Congressional SDI as well as general electronic distribution of CRS products.

- The American Memory Project is developing prototype files of materials from the Library's collections for general distribution.

- The Cataloging Distribution Service has CD-ROM editions of LC Name Authorities and LC Subject Authorities in production for distribution. LC bibliographic cataloging records in this format are being tested for production and distribution.

- The Prints and Photographs Division successfully completed a phase-one development of a one-videodisc edition of items from its collections and is now developing a two-videodisc edition for reference use and possible distribution.

- The American Folklife Center, The Music Division, and the Recorded Sound Section each have several CD-ROM disk publications of materials from their collections.

b. What procedures are in place to preserve historically important electronic records and software used in Library administration, services, and programs?

- The Library's Information Technology Services directorate retains certain versions/iterations of computer software, data files, and master records used in Library administration, services and programs. The selection of a particular file for retention is generally based upon its potential utility in the recreation of the current iteration of the file in the event that current iteration should be lost through machine malfunction or human error. Only a few files--most notably "year-end" versions of personnel/payroll files-- are retained and archived for their "historical" value.

6. a. Does the Library obtain assistance from other Federal agencies (i.e., the National Archives or the National Institute for Standards and Technology) in carrying out its machine-readable collections activities?

- Thus far, MRCRR efforts have been concentrated on organizing their internal operations and establishing meaningful liaisons within the Library complex.

- Preliminary conversations have been held with the National Archives and with the National Library of Medicine. A joint meeting of LC, NLM, and NAL is being considered to begin developing coordinated policies for acquisition, cataloging, service, and preservation of machine-readable materials.

- We have not consulted the National Institute for Standards and Technology to date because we have been primarily concerned with internal operations. We plan to seek their advice and guidance as we move forward with our long-term preservation program.

b. Are other libraries, either in the United States or abroad, involved in similar activities?

- After careful and continued searching, we have not identified another library or other institution which has announced plans to develop an archive of machine-readable materials, either in the United States or elsewhere.

CD-ROM Publications

- Many college, university, and large public libraries are using CD-ROM publications to complement their print reference collections but none are known to be archiving these materials.

Software Programs

- Many college, university, and large public libraries have either microcomputer labs for teaching purposes or limited collections of software programs for use by students and library patrons. None are known to be archiving these materials.

Foreign Interests

- We have identified only one foreign group, in Great Britain, which has indicated an interest in collecting software for archival purposes. Since opening in 1988, the MRCRR has been host to a large number of foreign visitors who are interested in learning about the possible use of microcomputers and CD-ROM publications in their government, library, or educational programs in their home countries.

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APPENDIX 2.—ASSOCIATION OF RESEARCH LIBRARIES MATERIAL

January 1989

Association of Research Libraries
1527 New Hampshire Avenue, N.W., Washington, D.C. 20036 (202) 232-2466

PRESERVING KNOWLEDGE: THE CASE FOR ALKALINE PAPER

Some Frequently Asked Questions

What is the problem?

Nearly 80 million books in North American research libraries are threatened with destruction because they are printed on acidic paper. Surveys confirm, in effect, that "slow fires," triggered by the acids in paper, are spreading through most research libraries, transforming book and journal collections into piles of paper fragments.

Acidic paper disintegrates because wood pulp contains acid impurities, and producers use additional acid chemicals to improve the printing characteristics of the paper. Over time these acids destroy cellulose fibers, causing paper to become brittle, darkened, and weak. The problem is compounded by air pollution, improper storage conditions, poor binding methods, and heavy or careless use. The primary cause of a book's disintegration, however, is the acidity of the paper on which it is printed.

What are the implications of the problem?

The catastrophic implication for scholarship and for society is the loss of significant portions of distinctive research collections representing the world's intellectual heritage. At the heart of the case for using alkaline paper for publications is a social and moral imperative to preserve knowledge for the future.

What is the solution?

The most cost-effective solution is to discontinue use of acidic paper for book production and to use instead alkaline, durable paper. The justification for this strategy is quite simple: printing books on alkaline paper eliminates the problem at its source. Publications produced on acid-free paper will last for centuries rather than decades. Use of alkaline paper in publishing will have a more direct impact on preserving knowledge than any other single effort.

What are the barriers to the use of alkaline paper?

Possibly the greatest barriers to the use of alkaline paper for publishing are lack of awareness of the problem of acidic paper and/or misperceptions about the availability and price of alkaline paper. In addition, paper producers face the costs of converting their mills in order to produce alkaline paper. However, even this barrier is dissolving as it has been demonstrated that once a mill is converted, manufacturing costs can be less than for acidic paper.

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What are the dimensions of the problem?

The problem began in the mid-19th century when, as a result of growing literacy and publishing, the increased demand for paper forced manufacturers to use more plentiful wood pulp instead of cloth rags in paper production. Books printed after 1850 are in the most immediate danger.

Already, at least one-fourth of the collections of most major university and research libraries in the United States and Canada are in some stage of serious embrittlement—that is, the paper breaks as the book is used. The Library of Congress estimates that over 3 million books in its collection are already brittle and that each year an additional 77,000 books enter the endangered category. The problem is not restricted to the Library of Congress or just a few large research collections. The same pattern of serious, advancing deterioration is found in many libraries with collections of materials published during the last century.

What does it take to save books already printed on acidic paper?

To preserve books already printed on acidic paper, librarians pursue several strategies depending on the condition of the book: for books already brittle, transferring the text from paper onto other media such as archival microfilm or optical disk; for books not yet brittle, treating books with processes that remove acid and strengthen the paper; for all books, improving environmental conditions for collections; and for some special materials, providing a wide range of conservation treatments. Depending on the treatment, the estimated costs of saving an acidic volume varies. Capturing the content of a brittle book on archival film costs from $60 to $100 per volume; deacidifying the book before it becomes brittle costs about $10 per volume.

Given the enormous amount of research materials in need of preservation, the cumulative dollar cost of saving deteriorating material is staggering. These costs, borne by public and private universities, the Federal Government, and some private foundations, cannot and should not be sustained indefinitely when a more cost-effective solution is at hand: stop publishing books on acidic paper.

What kind of paper do publishers use for books now?

It varies. American university presses use durable, alkaline paper for printing the major portion of their publications. However, with some notable exceptions, U.S. trade books and serials, and publications of the Federal and State governments, continue to be printed on acidic paper. A similar picture exists around the world.

What is the availability of alkaline paper?

Within the last two years, the production of alkaline paper in the U.S. has increased steadily and is characterized by the paper industry as "snowballing." More than 30 paper mills now produce alkaline paper. The paper industry forecasts a doubling of capacity over the next two years as several major paper manufacturers shift to alkaline production.

Is alkaline paper more expensive than acidic paper?

No. A recent survey of major paper manufacturers' prices in selected paper grades reveals that prices for acid-free, alkaline paper are comparable to those for acidic paper. (See "Major Paper Manufacturers' Prices for Acidic vs. Acid-Free Papers in Selected Paper Grades," *Alkaline Paper Advocate*, May 1988, 1:3, p. 20.)

What is the environmental impact of alkaline paper?

There is a significant, beneficial environmental impact since alkaline paper mills produce less pollution than acid paper mills. In the alkaline papermaking process, the elimination of use of aluminum rosinate permits tighter closure of the papermill water system, thereby less effluent is released into the environment. On another front, the process of biological decomposition of alkaline paper is comparable to that of acidic paper so there is no impact on solid waste disposal processes.

Can alkaline paper be made from recycled fibers?

Yes, as long as the paper being recycled is not more than 10% groundwood. At present two paper mills are known to produce alkaline paper from recycled fibers.

What are the incentives for alkaline papermaking?

The major incentives for paper mill conversions from acidic to alkaline paper are the potential for lowered manufacturing costs and positive anti-pollution characteristics. Three advantages are of special importance: use of calcium carbonate as a filler instead of more costly fiber; reduced water consumption in the manufacturing process; and improved waste management. From the standpoint of paper properties, calcium carbonate imparts a higher opacity and brightness to paper.

What steps have been taken to promote the use of alkaline paper?

Considerable progress has been made in promoting the use of alkaline paper. Many organizations have played a role in raising the level of understanding about the problem and have built the base for promoting use of alkaline paper. The Federal Government–especially through Congressional hearings, the Library of Congress, the National Library of Medicine, and the National Endowment for the Humanities–has played an important part in taking leadership and influencing papermaking and publishing. The Council on Library Resources and the Commission on Preservation and Access have made a significant contribution to publicizing and shaping the agenda for a national preservation strategy. The Association of Research Libraries, the National Humanities Alliance, other organizations, and concerned individuals have broadened awareness of the problem and expanded the base of support for the use of alkaline paper. University presses have led the way by using alkaline paper in most of their publications. Two major trade publishers–Random House and Simon & Schuster–have announced that all first printings of hardcover books will be on acid-free paper.

Several specific actions have been taken to focus attention on the alkaline paper issue:

- The Depository Library Council to the Public Printer in October 1987 adopted a resolution urging that alkaline paper be used for U.S. Government documents of enduring value; the first title to be issued on alkaline paper is the *Biographical Directory of the U.S. Congress*.

- The U.S. Joint Committee on Printing, the Congressional oversight committee for the Government Printing Office in May 1988 issued specifications for uncoated permanent printing paper. This is an important step toward making alkaline paper available to government agencies and advocating its use for government publications.

- The Board of Regents of the National Library of Medicine in February 1987 adopted a policy of actively encouraging the production of biomedical literature on permanent paper. A special task force is developing strategies for implementing this policy.

- The National Information Standards Organization (NISO) has distributed an information package about the standard for permanent paper (Z39.48-1984) to 2,400 U.S. publishers. NISO is currently revising the 1984 standard to include coated paper, and maintains a list of Manufacturers of Permanent Paper.

- The American Library Association at its 1988 Midwinter meeting adopted a resolution urging use of permanent papers in books and other publications.

- The Connecticut General Assembly in 1988 became the first state legislature to adopt a resolution supporting the use of alkaline paper for the printing of all State publications.

- The Technical Association of the Pulp and Paper Industry (TAPPI) sponsored in October 1988 the first Paper Preservation Symposium, during which participants expressed considerable support for mill conversion to alkaline paper production.

- The New York Public Library in October 1988 established the NYPL Center for Paper Permanency to serve as a clearinghouse for information about ongoing efforts related to advocating the use of alkaline paper.

- A committee of Authors and Publishers in Support of Preservation of the Printed Word was established at the New York Public Library in October 1988. This group, co-chaired by Barbara Goldsmith and Vartan Gregorian, solicits commitments from authors and publishers to put first printings on alkaline paper.

- Senator Claiborne Pell (D-RI) introduced a Senate Joint Resolution (SJR 394) for a "National Policy on Permanent Papers" on October 11, 1988, and has indicated his intention to pursue similar legislation in the 101st Congress.

What more needs to be done?

The magnitude of the problem requires an accelerated collaborative effort among leaders in the library community, academic institutions, the publishing industry, the paper industry, and government, as well as concerned scholars, authors, and others. The legislation pursued by Senator Pell provides a visible point of departure for more vigorous efforts to increase the use of alkaline paper in book production.

Paper Preservation in Library Collections: Basic Information

TERMINOLOGY

Acidic Paper

Acids are the primary cause of the deterioration of paper. Beginning in the mid-1800s, the use of groundwood and alum-rosin sizing introduced residual acids into the paper manufacturing process. Over time these acids destroy cellulose fibers, causing paper to become brittle, darkened, and weak. Eventually the pages cannot be turned without breaking, and the useful life of the book ends.

Most acidic book papers have a pH of around 5.5 or lower. The pH levels indicate acidity and alkalinity on a numerical scale from 0 to 14, in which 7 is neutral. Books with a pH of 6 are 10 times more acid than books with a pH of 7.

Alkaline Paper

Paper produced with alkaline-based chemistry is "acid-free," having a pH of 7.5 or greater. Under proper storage conditions, such paper will remain strong and supple for hundreds of years. While alkaline, "permanent paper" does not last forever, it will last several hundred years, as compared to several decades for acidic paper. It is sometimes referred to as long-lasting paper.

The Standard for Permanence

An American National Standard specifies the characteristics of permanent, uncoated paper as "paper that should last at least several hundred years without significant deterioration under normal library use and storage conditions." It is published as *Permanence of Paper for Printed Library Materials* (uncoated) ANSI Z.39.48 - 1984 (New York: American National Standards Institute, 1985).

Minimum requirements: alkaline pH of 7.5, alkaline reserve of 2% as a buffering agent; suggested values for tear resistance and folding endurance to insure durability; and pulp free of groundwood.

The National Information Standards Organization has established a committee to revise the 1984 standard for permanent paper to add specifications for coated paper. Coated paper has a smooth surface essential to printing high quality half-tone illustrations. Although the coatings used by paper makers are generally alkaline, the core paper can be alkaline, neutral or acidic.

Durability

Durable paper has high initial strength and resists wear and tear. While folding endurance and tear resistance are not directly related to paper permanence – that is, its chemical stability – they are included in the standard to ensure reasonable durability of the finished paper.

Identification of Paper

The standard for permanent paper suggests that a statement noting compliance with the American National Standard Z39.48-1984 appear on the verso of the title page of a book and in the masthead or copyright area for periodicals, with a logo consisting of a circle surrounding an infinity symbol. ♾

Paper Preservation in Library Collections: Basic Information

TECHNIQUES

The techniques libraries apply to preserve a book printed on acidic paper depend on how far the deterioration has progressed. In a sequence of bad-to-worse stages of deterioration, the following actions may be taken.

Endangered Books

Endangered books are those printed on acidic paper, but not yet deteriorated enough to be considered brittle.

Environmental Controls for Libraries: All books benefit from improved, stable environmental conditions. Strict environmental control systems may be installed in libraries to slow the rate of deterioration of acidic paper. The most effective preventive technique is maintaining cool temperatures, controlled humidity, and filtering to remove gaseous pollutants that promote acid deterioration.

Deacidification: A deacidification process can be used to prevent the acid deterioration of paper. In this process, chemicals turn acidic books alkaline and leave a residual buffer that consumes acid in the future. The effect is to extend the life remaining in the paper at the time it is treated. Manual deacidification processes are available; however, the expense of page-by-page treatment makes its application prohibitive for large numbers of acidic materials in most libraries and archives. Only one mass deacidification process has been in operation for any length of time. For seven years the National Library of Canada has used the Wei T'o nonaqueous book deacification system. Several other mass deacidification processes are under development. One is near readiness: the Library of Congress is concluding the engineering phase for a mass deacidification process using gaseous diethylzinc (DEZ). Note: deacidification is a preventive measure and is not effective for treatment of books that have already become brittle.

Brittle Books

In the course of deterioration, an acidic book reaches a point beyond which the above treatments are not possible or effective. When a book reaches this point-of- no-return stage, it is defined as brittle. Technically, a book is considered brittle when the corner of a page breaks away after only a few folds. Steps taken by libraries to preserve brittle books depend on the intellectual and artifactual value of the book itself, the policies of the library, and the resources available.

Copying: The text can be photocopied onto alkaline paper.

Reformatting: The text can be transferred onto another medium such as archival microfilm or optical disk.

Paper Strengthening: Paper may be strengthened by chemical impregnation. One promising approach is parylene coating. This does not however, retard the process of chemical deterioration itself, unless deacidification is also part of the treatment.

Conservation: A range of conservation treatments are available to preserve the book in its original form. However, these time-consuming and expensive processes are generally reserved for items with artifactual value that must be retained in the original.

APPENDIX 3.—GOVERNMENT PRINTING OFFICE (GPO) SUBMISSIONS

A. BILL COMMENTS

United States Government Printing Office
Washington, DC 20401

OFFICE OF THE PUBLIC PRINTER

August 24, 1989

Honorable Robert E. Wise, Jr.
Chairman, Subcommittee on Government Information,
Justice, and Agriculture
Committee on Government Operations
U.S. House of Representatives
Room B-349-C, Rayburn House Office Building
Washington, DC 20515

Dear Mr. Chairman:

Thank you for the opportunity to provide comments on H.J. Res. 226, which would establish a national policy on permanent papers.

The Government Printing Office (GPO) has no objections to H.J. Res. 226. We have noted growing support for the use of acid free paper to enhance the longevity of Government publications of enduring value.

I provided testimony on acid free paper during hearings before the House Subcommittee on Legislative Branch Appropriations in February, and again before the House Subcommittee on Science, Research, and Technology in May. My testimony may be summarized as follows:

- Under Title 44, United States Code, the Joint Committee on Printing (JCP) establishes the quality of paper used in Government printing and binding. GPO's role in paper usage is limited to buying the paper and supplying commercial contractors with appropriate standard samples.

- The current paper standards include a JCP Government Specification Standard, JCP A270, which satisfies the criteria of American National Standards Institute (ANSI) Z 39.48 for archival paper. The Library of Congress and the National Institutes of Health have printing papers that require the use of this paper, for example, and the

recent Biographical Directory of the U.S. Congress was also printed on this paper. GPO has also provided the JCP with another specification, JCP A-61, for a smooth finish, high quality acid free opecified book paper. Together, these specifications encompass most of the commercial commodity grades of calcium carbonate loaded paper now being sold.

- GPO purchases approximately 100 million pounds of paper per year for inhouse production use and blank paper sales, including direct mill shipments. GPO's commercial printing contractors purchase approximately 660 million pounds of paper per year for GPO work. Based on industry data, GPO estimates that approximately 15 to 30 percent of the total amount of paper purchased for GPO work is acid free. Accordingly, anywhere from 15 to 30 million pounds of the paper used for inhouse production and blank paper sales is acid free, while contractors purchase between 99 and 198 million pounds of acid free paper for GPO work. Since an increasing number of mills are converting to alkaline production processes, the proportion of acid free papers used for GPO work is expected to increase.

- In recognition of the growing interest in acid free paper, GPO has begun to encourage Federal publishing officials to use acid free paper in their publications printed by GPO. As directed by the House and Senate Appropriations Committees in reports accompanying H.R. 3014, GPO will also "develop a plan to identify the extent, source, and types of archival type printing matter produced inhouse and acquired commercially by the GPO, or other agencies. The plan [will] also include a strategy and schedule to convert this printing to alkaline paper."

Thus, GPO would have no problem in assisting Federal agencies which request that acid free permanent papers be used in printing Government publications of enduring value, as required by H.J. Res. 226.

My testimony before the Subcommittees on Legislative Branch Appropriations and Science, Research, and Technology noted two general concerns about the Government's use of acid free paper, both of which now appear to have been satisfied. My first concern was that governmentwide demand for an increased supply of acid free paper might outstrip the ability of the paper industry to supply such paper at competitive prices, at least in the short term. It now appears that the industrywide conversion to alkaline production processes is proceeding at

a fast enough pace to ensure competitive prices for acid free paper on Government bids. Indeed, GPO has found that among the bids received on recent quarterly contracts for paper, the cost of acid free paper is not significantly different from acid paper, and in some cases is actually lower. Commercial printing contractors, who generally buy paper in smaller lots than GPO, may, however, experience price differentials, although GPO has no direct evidence that this is occurring.

My second concern was that the resource conservation goals of the Environmental Protection Agency (EPA) guidelines implementing section 6002(E) of the Resource Conservation and Recovery Act of 1976, as amended, may impede the emerging national program to encourage the use of acid free paper in Government publications. GPO has initiated an affirmative program for the procurement of recycled paper products, in compliance with the EPA guidelines. While there now appears to be no technical reason that acid free paper cannot be produced from recycled fiber, it still appears that there is a short supply of acid free recycled paper, since the EPA was able to identify only two paper mills currently producing such paper. However, I was encouraged to learn that Rep. Doug Walgren recently introduced H.R. 3094, to amend the Solid Waste Recovery Act to make nonacidity a criteria that must be met by suppliers of recycled paper for printing and archival use by Federal agencies.

One final point I made before the Subcommittee on Science, Research, and Technology concerned the inclusion of electronic information technology alternatives in discussing the issue of preserving Government publications. Although it did not comment directly on the paper preservation issue, the recent Office of Technology Assessment (OTA) report on Federal information dissemination, Informing the Nation: Federal Information Dissemination in an Electronic Age (October 1988) examined in great detail the opportunities that await the Federal Government for the compilation, transmission, storage, and retrieval of Government information by virtue of electronic information technologies. OTA concluded that although ink-on-paper is currently the predominant information medium used by the Government, the Government has already begun the transition to significant use of electronic technologies and formats, and OTA projects an increasingly rapid transfer of Government publications, reports, and other documents to these technologies in both the short (1-3 years) and long (5-10 years) terms. For those publications which are not deemed to be of enduring research value, these technologies are giving Federal agencies an expanding range of options to provide low-cost information services to the public.

While I believe strongly that the Government should make every effort to ensure the longevity of information products for public use, I also believe that the cost and utility of paper preservation efforts should be balanced against the opportunities provided by information technology advances to ensure that Government information remains as accessible as possible, in terms of cost, timeliness, and utility, to the broadest range of information users.

Thank you again for this opportunity to comment on H.J. Res. 226. I would be pleased to discuss this matter further with you, if you so desire.

Sincerely,

JOSEPH E. JENIFER
Acting Public Printer

B. GPO PLAN FOR USE OF ALKALINE PAPER

United States Government Printing Office
Washington, DC 20401

RECEIVED
MAY 1 1990
Government Information, Justice and Agriculture Subcommittee

OFFICE OF THE PUBLIC PRINTER

MAY 01 1990

Honorable Robert E. Wise, Jr.
Chairman, Subcommittee on Government Information,
Justice, and Agriculture
Committee on Government Operations
U.S. House of Representatives
Washington, DC 20515-6147

Dear Mr. Chairman:

H.J. Res. 226, regarding a national policy on permanent paper, has been referred to your Subcommittee. To assist you in your consideration of this proposed legislation, transmitted herewith is a plan developed by the Government Printing Office (GPO), in consultation with the staff of the Joint Committee on Printing, to identify the extent, source, and types of archival type printing matter produced in-house and acquired commercially by GPO or other agencies. The plan includes a strategy and schedule to convert this printing to alkaline paper. The plan has been developed in accordance with the direction of the Committee on Appropriations, House of Representatives, in House Report No. 101-179 (July 26, 1989).

Sincerely,

ROBERT W. HOUK
Public Printer

Enclosure

United States Government Printing Office

USE OF ALKALINE PAPER
IN
GOVERNMENT PRINTING

Report and Plan
Prepared at the Direction of the
Committee on Appropriations
House of Representatives

April 1990

Executive Summary

The Government Printing Office (GPO) is the single largest producer of publications for the Federal Government. In addition, GPO supplies paper to other Federal agencies in the Washington, DC, area.

In view of the mounting costs of preservation efforts currently being undertaken to combat the deterioration of books printed on acid paper, as well as the increasing availability of alkaline paper at competitive prices, GPO has been directed by the Committee on Appropriations, House of Representatives, to develop, in consultation with the Joint Committee on Printing (JCP), a plan to "identify the extent, source, and types of archival type printing matter produced in-house and acquired commercially by [GPO], or other agencies. The plan should also include a strategy and schedule to convert this printing to alkaline paper."1/

Fiscal year 1989 data shows that approximately 57 percent of the book-publishing and related papers purchased by GPO for in-house use and supplied to Federal agencies was produced by paper mills using alkaline production processes. This paper was purchased at prices that were competitive with acid paper, since GPO's paper procurement system is designed to purchase paper which is the least expensive grade available that meets the Government's needs. Approximately 40 percent of the total volume of paper used to produce contract printing for GPO is estimated to be alkaline.

The implementation in 1989 of the Environmental Protection Agency (EPA) guidelines on paper containing recovered materials does not appear to have adversely affected GPO's ability to obtain adequate supplies of alkaline paper.

The JCP and GPO believe that alkaline paper is available in sufficient supply, and at competitive prices, to provide for increased printing of Government documents designated as having enduring value. Many Government publications apparently are already being printed on such paper.

What is lacking at this time are operational mechanisms to identify those Government publications of enduring value that should be printed on alkaline paper, and to ensure that available alkaline paper stocks are matched with all printing that requires such paper. This plan details several steps that the JCP and GPO will take in fiscal years 1990 and 1991 to establish and monitor the effectiveness of such mechanisms.

Background

In Congressional hearings last year on paper permanency, Senator Claiborne Pell observed that the United States faces

> a silent crisis because of the self-destruction of the acidic papers on which books and other publications have been printed since the mid-19th century. The preservation of the whole record and literary output of the most remarkable century of human experience to date is in jeopardy and we should do everything we can to extinguish the smokeless fire and prevent its spread.2/

According to various estimates, from 75 million to 77 million volumes or a quarter of the total holdings in American research libraries are deteriorating due to publication on acid paper. At least 10 million of these books and periodicals are unique copies. In some collections, as many as 40 percent of the total volumes may be in danger of being lost because of embrittled paper. High embrittlement rates have been reported by many of the libraries housing the Nation's major research collections, including the Library of Congress, the libraries at Stanford and Yale Universities, the New York Public Library, and the National Library of Medicine.3/

Book preservation programs involve several approaches, including repairing, restoring, rebinding or boxing the original, or reformatting the entire publication. Reformatting has become a widely accepted alternative, typically involving conversion of the original publication to microfiche, although other technologies, including optical disks, are also being employed. At an average conversion cost of $60.00 per volume, however, microfiche reformatting is an expensive alternative. Another alternative, diethyl zinc deacidification, which uses a technology patented by the Library of Congress, results in a preservation cost of $3.50-$5.00 per volume.4/ Given the extent of the deterioration that has occurred in many large research and general literature collections, the total projected cost of using these preservation methods may run into the hundreds of millions of dollars.

To avoid preservation costs for books published today, the book publishing and library communities and other concerned citizens have urged that greater use be made of alkaline paper. Alkaline paper has a much longer life than acid paper (typically more than 200 years, compared to the 50-year average life of acid paper), because the chemicals that tend to cause degradation at acid pH's have either been significantly reduced or totally removed from the paper production process.5/

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The call for increased use of alkaline paper in the publishing industry has coincided with its increased availability, due to changes in the papermaking process arising principally from the introduction of synthetic sizing chemicals. The use of calcium carbonate filler (an alkaline salt) and alkaline sizing resins in lieu of the combined use of alum (aluminum sulfate, an acid salt) and rosin as paper sizing permits a change in papermaking chemistry from the traditionally acid pH levels of 4.5-5.5 to the neutral (pH of 7.0) or alkaline side (pH greater than 7.0) of the pH scale. The changeover to alkaline paper production methods can generate significant economic benefits for paper manufacturers in terms of decreased production costs, while yielding paper with improved opacity and comparable strength and printability. The finished product can be sold at prices that are competitive with paper produced by acid production methods.6/

There is a general consensus today that U.S. paper mills are increasingly converting to alkaline production processes, although precise information about the extent of actual and planned mill conversions throughout the industry is difficult to obtain. However, there are indications that industrywide conversion to date has been extensive, reaching and perhaps exceeding 30 percent.7/

U.S. Government publications represent a significant component of the annual contribution to library research and general literature holdings. To ensure that this body of information remains accessible to future generations, Congress has taken steps to develop a national paper preservation policy. Two bills, S.J. Res. 57 (Senator Claiborne Pell) and H.J. Res. 226 (Rep. Pat Williams) would establish such a policy by encouraging Federal agencies and the private sector publishing industry to ensure that publications of enduring value are printed on acid-free paper. Hearings conducted by the Subcommittee on Science, Research and Technology, House of Representatives, in May 1989 explored this issue. These actions generally reflect the transition to alkaline papers currently being pursued by other governments.8/

Permanent Paper

There is a significant body of knowledge today about the requirements for paper permanency, arising principally from studies conducted by William J. Barrow in the late 1950's. Permanency is ensured by manufacturing methods which provide paper with greater folding endurance, tear resistance, and color retention over prolonged periods. These properties are described by the American National Standards Institute (ANSI) standard for

permanent paper (ANSI Z39.48-1984). The ANSI standard has been incorporated into a JCP paper specification, JCP A-270, for permanent paper.

Acid-Free, Alkaline, and Permanent Papers

Current discussions of book preservation frequently confuse the interchangeability of the terms "acid-free," "alkaline," and "permanent" papers. For example, S.J. Res. 57 and H.J. Res. 226 call for a national policy on "acid-free, permanent" paper.

While the terms "acid-free" and "alkaline" are generally interchangeable, the term "permanent" is not. "Acid-free" paper and "alkaline" paper are understood to refer to printing papers manufactured by production processes resulting in paper with a specifically acid-free (neutral pH) or specifically alkaline pH (pH greater than 7.0) value. The trade literature on the manufacturing of paper by non-acidic production processes refers to all such paper generically as "alkaline" paper, since acidity in paper is eliminated by the introduction of alkaline chemicals into the papermaking processes. The literature does not distinguish "acid-free" papermaking processes from "alkaline" processes. Hence, the term "acid-free" is relevant primarily to the focus of Government paper policy on eliminating acidity as a threat to paper longevity.

Together, "acid-free" and "alkaline" papers are in significantly greater abundance than "permanent" papers, a subset of non-acidic papers that are specifically manufactured for archival purposes, containing either a neutral or alkaline pH value, and with the folding, tear resistance, and color retention properties designated by the JCP A-270 paper specification. These are currently considered specialty papers.

Thus, while all paper meeting the JCP A-270 paper specification is either technically acid-free or technically alkaline, not all acid-free and alkaline papers available on the market today meet the requirements of JCP A-270. Thus, they cannot be considered truly permanent papers. Most mills are producing paper in which the fiber has been supplemented with precipitated calcium carbonate filler. These papers will print well, but many do not possess the greater fiber strength and folding properties that are required of paper manufactured with optimum archival properties. While they will indeed survive much longer than acid papers, their lower fiber strength does not qualify them as truly permanent papers.

This report discusses the use of alkaline paper in U.S. Government printing, based on the assumption that the terms "acid-free" and "alkaline" are synonymous from the standpoint of

assuring increased paper longevity. It focuses on the on-going replacement of acid papers by alkaline papers under the current JCP paper standards. The use of the term "permanent" paper is restricted to those papers specifically meeting the industry standard for permanency, as contained in JCP A-270.

This report assumes that alkaline papers currently available on the market are sufficient to meet most Government requirements for documents that are destined for library and research collections. Papers meeting the JCP A-270 paper specification for permanency are assumed to be needed only for those Government documents requiring optimum archival capabilities.

GPO Programs and Services

The public printing and documents chapters of Title 44, U.S. Code, require GPO to fulfill the printing and binding needs of the Federal Government and distribute Government publications to the public. Sections 501 and 502 of Title 44 require GPO to provide printing and binding services for Congress, Federal agencies, and the Judiciary through in-house production and commercial procurement. Major GPO products include the Congressional Record and all other printing required by Congress, the Federal Register, U.S. passports, U.S. Postal Service postal cards, books, pamphlets, forms, and a wide range of other graphic arts products. GPO also supplies blank paper to Federal agencies in the Washington, DC, area under the authority of section 1121.

Government publications are distributed by GPO's Superintendent of Documents through distribution to recipients designated by law (Title 44, various sections); distribution to recipients designated by publishing agencies (section 1701); sales to the public (section 1702); and through the Depository Library Program (section 1902). In addition, Title 44 assigns the responsibility for indexing and preparing a catalog of Government documents to the Superintendent of Documents (sections 1710 and 1711), and provides for the distribution by the Superintendent of Documents of Government publications to foreign libraries, under the administration of the Library of Congress (section 1719).

For fiscal year 1989, GPO printed or procured 1.9 billion publications on nearly 346,000 printing orders. This work was performed for Congress and approximately 135 customer Federal agencies. Over 293,000 of these printing orders were fulfilled by procurement from the commercial printing industry. Of the 98.1 million pounds of paper issued by GPO's central office plant in fiscal year 1989, 43 percent was supplied to Government agencies and 57 percent was used for in-house printing.

Superintendent of Documents operations distributed approximately 99 million copies of Government publications during fiscal year 1989 through the Statutory and Agency Distribution Programs (30.5 million copies), the Sales of Publications Program (25 million copies), Consumer Information Sales operated on a reimbursable basis for the General Services Administration (19.7 million copies), the Depository Library Program (23.5 million copies, excluding distribution performed by agencies operating under depository agreements with GPO), free and sales distribution of the Federal Register (9.4 million copies), and publications distributed through the International Exchange Program (0.7 million copies). In addition, the Superintendent of Documents received approximately 107,000 publications for classification during the year, and 29,000 publications for cataloging.

Government Paper Program

The Federal Government is a relatively small consumer of the total amount of printing and writing papers produced annually in the United States. Appendix A shows that approximately 21.8 million tons of printing and writing paper were produced domestically in 1988, the most recent year for which total Government paper consumption data is available. Of that amount, approximately 485.7 thousand tons were purchased by the Government, yielding a Government consumption rate of approximately 2.2 percent for the year. There was a similar consumption rate for 1987.9/

Title 44 establishes the provisions under which GPO buys paper. Section 509 provides that the JCP "shall fix upon standards of paper for different descriptions of public printing and binding." GPO's obligations under these statutes are to buy paper ordered against the JCP paper specifications, test it for compliance with the specifications, and supply bidders with appropriate samples. The JCP paper specifications are established around those papers that are readily available on the commercial market which are the least expensive grade suitable for the Government's use.

The current JCP paper specifications include over 75 specifications for a wide variety of papers, ranging from newsprint, book publishing and map papers, to parchment, fine writing, and copier papers, as shown in Appendix B.

As noted above, the JCP A-270 paper specification offers the Government user the assurance that the product satisfies the criteria of ANSI Z39.48-1984 for permanent, archival quality paper. JCP A-270 actually is more stringent than the ANSI standard, since it requires minimum strength properties that are

described as optional in the ANSI standard. In addition, the JCP is evaluating another specification, JCP A-61, for a smooth finish, high-quality alkaline offset book paper.

GPO Paper Purchases

Appendix C shows that during fiscal year 1989, GPO purchased approximately 93.3 million pounds of paper for in-house use and use by Federal agencies in the Washington, DC, area. Paper purchased by the pound totaled 72.5 million pounds, including 13.1 million pounds of newsprint. Paper purchased by the sheet totaled 1.5 billion sheets (or approximately 20.8 million pounds). With the exception of newsprint, which is used primarily for printing the Congressional Record and the Federal Register and is purchased on annual contracts, the majority of the paper GPO buys is against quarterly term contracts.

The 46.8 million pounds of paper purchased against quarterly term contracts were book printing papers (37.5 million pounds), writing papers (2.6 million pounds), map papers (2.5 million pounds), and other papers (4.2 million pounds), as shown in Appendix D. The 1.215 billion sheets purchased against quarterly term contracts were copier paper (1.205 billion sheets), paper for postal cards (7 million sheets), and other papers (3 million sheets), as shown in Appendix E.10/

During 1989, GPO's average monthly inventory of paper was 33.4 million pounds, with a high of 35.4 million pounds recorded in July 1989 and a low of 31.2 million pounds recorded in January 1989. The average turnover rate for items stored in inventory was 164 calendar days, equating to 2.23 turnovers per item annually. Some items, including book publishing paper, turned over at a much faster rate.

Most GPO printing is performed under contract by commercial printers. There is no data available on the precise amount of paper consumed by these printers. Based on an analysis of products produced for fiscal year 1988, however, GPO estimates that approximately 660.8 million pounds of paper were consumed in printing performed under GPO contracts that year. This volume is assumed to have been relatively stable for fiscal year 1989.

Approximately 62 percent of the papers specified for GPO printing contracts is 50 lb. offset book paper. Other primary varieties of papers used are 60 lb. offset book, 20 lb. writing, 25 lb. newsprint, and specialty papers and boards.

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GPO Alkaline Paper Purchases

During fiscal year 1989, 57 percent of the total amount of paper purchased by the pound against quarterly term contracts was from mills known to use alkaline production processes. Paper purchased by the pound is used primarily for book-publishing and related purposes. This data is shown in Appendix F.

Only 3 percent of the paper purchased by the sheet against quarterly term contracts was from alkaline mills, due to the predominance of copier paper, which is manufactured primarily by acid papermaking processes (although some copier paper manufacturers from which GPO purchases such paper have recently converted to alkaline manufacturing processes). This data is also shown in Appendix F.

Alkaline paper was present in relatively the same proportion in the paper purchased by GPO in 1988, as shown in Appendix G. An assumption can be made that similar proportions of alkaline paper were present in the paper purchased on the open market during both fiscal years.

Variances in the percentage of alkaline paper purchased between one quarterly period and the next are due to paper market conditions.

Appendices H and I provide a breakdown, by JCP paper specification, of the amount of alkaline and acid paper purchased against GPO quarterly term contracts in 1989. Approximately 61 percent of the printing papers covered by category A of the specifications, used primarily for book publishing, were from alkaline mills. For paper meeting the A-55 specification, which represented the largest amount of paper purchased by the pound against a single specification in 1989, approximately 65 percent was purchased from alkaline mills.

The pH requirements of the current JCP paper specifications are set at levels sufficient to guarantee maximum competition in Government paper purchases. Except for JCP A-270 and A-61 (currently under consideration), none of the specifications which specify pH values currently requires alkaline paper. Paper purchased against JCP A-55, for example, requires a minimum pH value of 4.5, in the traditionally acid range, yet significant quantities of this paper are available with an alkaline pH while still meeting all other requirements of the specification.

The preponderance of alkaline paper among the 1989 contract purchases of paper by the pound indicates that it was available on the market in sufficient quantities to ensure its procurement at prices that were competitive with acid papers.

Alkaline Paper Purchases by GPO Printing Contractors

There is no data on the volume of alkaline paper used by GPO's printing contractors. Estimates must be derived from data on the presence of alkaline paper on the market, currently estimated at between 30 percent and 40 percent of the total volume of printing and writing paper available (see note 6).

Such estimates must be qualified by several factors, however. First, GPO's printing contractors tend to buy paper in smaller lots than GPO, so it is not reasonable to assume in all cases that they are experiencing alkaline paper purchases in the same proportion that has been experienced by GPO. Second, the presence of alkaline paper marketwide may have no bearing on what paper a printing contractor purchases, since in the absence of a printing requirement for alkaline paper a contractor is most likely to continue to purchase paper from the most cost-effective supplier regardless of its acid or alkaline pH value.11/

On the other hand, the preponderant use of offset book papers by GPO's contractors strongly suggests that significant amounts are alkaline, since it is in these papers that GPO has seen a significant alkaline presence. Thus, GPO estimates that approximately 40 percent of the paper used by GPO's contractors, or about 264.3 million pounds (based on 1988 estimates), is likely to be alkaline.

GPO Alkaline Paper Usage

No data is currently available to indicate the numbers and types of publications that are being printed on alkaline paper by GPO and GPO's printing contractors. However, because of the amounts of alkaline paper available to GPO and to GPO's contractors, GPO has been able to meet requests for its use.

Agencies have been specifying requests for alkaline paper on their printing requisitions submitted to GPO (Standard Form 1), although the extent of these requests, which fall outside of existing SF-1 reporting procedures, is not known. More important, it appears that GPO's available alkaline paper stocks have been used in printing without the submission of specific requests for its use.

GPO has also been able to meet requests for papers requiring the JCP A-270 specification. The Library of Congress and the National Library of Medicine currently have printing programs that require the use of these papers. Permanent paper has been used in Congressional printing. The recent Biographical Directory of the United States Congress, 1774-1989 was printed on paper meeting the JCP A-270 specification.

Currently, there are no provisions for making an imprint on Government publications which would indicate whether alkaline or permanent paper has been used.

Depository Library and International Exchange Distribution

Since 1977, when GPO began converting publications to microfiche to achieve savings in printing and postage costs, the majority of Government documents distributed by GPO to depository libraries and foreign libraries has been in microfiche. Appendix J shows that in fiscal year 1989, 61 percent of all publication copies distributed through the Depository Library Program, and 88 percent of all copies distributed through the International Exchange Program, were in microfiche format.

Given the significant presence of alkaline paper in the mix of papers used by GPO and GPO printing contractors today, an assumption can be made that, since fiscal year 1988, a sizeable proportion of the publications distributed through the Depository Library and International Exchange programs in paper format were printed on alkaline paper. Publications printed on permanent paper meeting the JCP A-270 specification have also been distributed, but only where publishing agencies have specified the use of such paper in their printing requisitions.

Impact of EPA Guidelines on Recovered Materials

In June 1989, GPO implemented an affirmative program for the procurement of newsprint, catalog/directory, high-grade printing and writing papers, and paperboard containing recovered materials, following guidelines issued by the Environmental Protection Agency (EPA) that month pursuant to section 6002(e) of the Resource Conservation and Recovery Act of 1976, as amended.

The Act requires Federal agencies to procure paper and paper products composed of the highest percentage of recovered materials practicable, and to develop programs to assure that such papers are purchased to the maximum practicable extent. The Act provides four criteria for determining "practicability:" (1) performance in accordance with specific applications; (2) availability at a reasonable price; (3) availability within a reasonable period of time; and (4) maintenance of a satisfactory level of competition in paper purchases.

GPO's program was implemented in consultation with the JCP. The program was made effective with the August 1, 1989, quarterly paper term contract.

GPO currently requires a minimum percentage of postconsumer recovered materials or waste paper, as established by the EPA

guidelines, in the various grades of paper purchased for in-house use or supplied to Federal agencies. For ten grades of paper (e.g., brown papers, corrugated boxes, recycled paperboard), from 5 percent to 80 percent of postconsumer recovered materials are required. For 33 other grades of paper (e.g., offset book printing papers, writing papers, envelopes, cover stock), a 50-percent minimum content of waste paper is required.

For papers purchased by GPO, contracts will only be awarded to paper suppliers who meet the requirements for recovered materials. This policy applies only to the first bidding. If contractor responses are insufficient or unresponsive to the first bidding, a second bidding will consider papers made of virgin fibers. However, GPO has received nearly total coverage on its solicitations of bids for paper contracts covered by the EPA guidelines, and no second bidding has been required.

In GPO's Printing Procurement Program, the EPA minimum content guidelines have been implemented successfully for all commercially-performed jobs procured under term contract and sealed bid procedures. These represent the vast majority of the work procured annually by GPO, in terms of both procurement actions and dollar value. Jobs procured by GPO under small purchase procedures (representing about one-sixth of the total jobs procured each year, and still less in terms of dollar value) currently are exempt from the EPA guidelines in order to ensure responsive and timely production schedules. However, continued movement in the paper industry toward increased production of paper containing recovered materials should eventually make this exemption unnecessary.

As Appendices K and L show, the proportion of alkaline paper purchased by GPO subsequent to the implementation of the EPA guidelines has varied, although it has remained strong. Approximately 76 percent of the paper bought by the pound against the quarterly term contract beginning August 1, 1989, was alkaline. This volume exceeded the average annual percentage of alkaline paper purchased for the entire preceding fiscal year. The proportion of alkaline paper declined to 40 percent for paper purchased by the pound for the quarterly term contract beginning November 1, 1989.

With only two quarterly periods of data, GPO attributes the variance to paper market conditions rather than the capability of the industry to produce alkaline paper containing recovered materials.

Plan for Increased Alkaline Paper Usage

The JCP and GPO have developed the following plan to:

- identify the extent, source, and types of archival type printing matter produced in-house and acquired commercially by GPO or other agencies;
- ensure that alkaline paper is used in printing Government publications designated as having enduring value; and
- provide for accurate reporting of alkaline paper usage.

The plan is based on use of regular alkaline paper stocks, but provides for the use of permanent paper meeting the requirements of JCP A-270 wherever it is specifically requested.

Plan Elements

(1) Depository Library and Publishing Agency Survey. Libraries served by the Depository Library Program will be surveyed by GPO to determine which acquisitions currently being received in paper format are considered to be of enduring value, and thus candidates for alkaline paper use.

GPO, in consultation with the JCP, will coordinate the library survey results with agency publishers to provide for agency input, and to obtain information on any additional publications regarded as having enduring value.

Subsequently, GPO will establish a mechanism to ensure that printing requisitions reviewed for inclusion in the Depository Library Program, which meet the requirements for enduring value established by the final survey results, include the appropriate requirement for alkaline paper. Such a requirement will involve the entire printing run of each designated publication.

(2) JCP Guidelines. With GPO assistance, the JCP will prepare and issue guidelines on the uses of alkaline and permanent papers in the printing of Government publications designated as having enduring value. The guidelines, to be circulated by GPO's Customer Service Department to agency publishers, and by GPO's Library Programs Service to depository libraries, will be designed to inform and assist agency publishers, agency printing officers, and depository librarians. The guidelines will include definitions of alkaline paper and permanent paper, and will establish general qualifications for determining "enduring value."

(3) Revised GPO Form 3868. GPO Form 3868, "Notification of Intent to Publish," will be revised to provide for a standard check-off space to indicate whether the publication is intended by the issuing agency to be of enduring value.

(4) Revised SF-1. Standard Form 1, used by agencies to submit requisitions for printing by GPO, will be revised to include a standard check-off space for agencies to denote requisitions for publications with enduring value, and to select alkaline stocks for printing.

(5) Paper Inventory and Job Planning Procedures. The JCP and GPO will review GPO in-plant paper inventory and job planning and scheduling procedures to ensure that alkaline paper stocks are matched to all printing jobs requiring such paper.

(6) GPO Printing Contractors. Requirements for alkaline paper usage in publications with enduring value, where applicable, will be made part of GPO's contracts for procuring printing from private sector printers. Appropriate changes will be made to contracting specifications, and appropriate testing procedures will be developed by GPO's Quality Control and Technical Department to monitor contractor compliance with alkaline paper requirements.

(7) Agency Notification. Customer agencies, including Congressional committees, will be notified by a GPO Circular Letter of the availability of alkaline stocks through GPO. Agencies will be informed of the option to specify such stocks on printing requisitions submitted for publications designated by the publishers as having enduring value.

(8) Imprint. The JCP and GPO will review the concept of an imprint to indicate whether Government publications have been printed on alkaline paper or permanent paper. The imprint would be useful to librarians in identifying materials suitable for long-term archival usage. The imprint will be provided only for identification purposes and will not constitute a guarantee of paper longevity, since longevity can be affected by many factors beyond GPO's control.

(9) Supplies of Blank Paper to Federal Agencies. GPO will develop procedures to inform Federal agencies of the availability of alkaline paper through GPO, and to supply such paper, either directly or by direct mill shipments, to agencies.

(10) JCP Paper Specifications. JCP and GPO will review all current and new JCP paper specifications for opportunities to incorporate requirements designed to ensure increased alkaline paper usage by the Government with minimal cost impact.

(11) Control and Reporting Mechanisms. GPO will establish appropriate control and reporting mechanisms to monitor the implementation of these initiatives.

Implementation Schedule

(1) As of May 1, 1990, all mills supplying paper to GPO will be required to provide GPO with information on whether the mills utilize alkaline or acid processes to produce the paper.

(2) The JCP/GPO review of GPO's inventory and job planning and scheduling procedures will be initiated in fiscal year 1990, with changes resulting from the review to be implemented by fiscal year 1991.

(3) Actions to initiate the survey of depository libraries and publishing agencies will be initiated in fiscal year 1990, with completion set for fiscal year 1991.

(4) The survey findings will provide the basis for establishing guidelines on "enduring value," which will be included in the JCP guidelines on paper longevity and the use of alkaline paper in Government printing. The guidelines are projected to be issued to depository libraries and agencies in fiscal year 1991.

(5) The issuance of the JCP guidelines in fiscal year 1991 will be accompanied by the agency notification letter regarding the availability of alkaline stocks for Government printing.

(6) Action to revise the SF-1, GPO Form 3868, and GPO contracting procedures, will be initiated in fiscal year 1990. These will not be implemented until the completion and issuance of the JCP guidelines and agency notification letter in fiscal year 1991.

(7) Action to revise the procedures for supplying paper to agencies will be initiated in fiscal year 1990, with implementation projected for fiscal year 1991.

(8) The concept of an imprint will be submitted to the JCP for review. The review of current and new paper specifications will be conducted on an on-going basis.

(9) GPO will provide annual reports to Congress, concurrent with appropriations submissions, on alkaline paper usage in Government printing and on the status of the initiatives proposed in this plan. All initiatives are scheduled to be implemented by the end of fiscal year 1991.

SOURCES/NOTES

1/ House Report No. 101-179 (July 26, 1989), accompanying H.R. 3014, the Legislative Branch Appropriations Bill, 1990, pp. 34-35.

2/ Statement of Senator Claiborne Pell, in "Preservation of Print," Hearings before the Subcommittee on Science, Research and Technology, Committee on Science, Space and Technology, House of Representatives (May 4, 1989), p. 9.

3/ Statement of Barbara Goldsmith, New York Public Library, "Preservation of Print" Hearings, p. 17; Office of Technology Assessment (OTA), Book Preservation Technologies (1988), in Technical Association of the Pulp and Paper Industry (TAPPI), Proceedings of the 1988 Paper Preservation Symposium (1988), p. 185; Sally A. Buchanan, "The Reality of Slow Fires," TAPPI Proceedings, p. 27; and Donald A.B. Lindberg and Charles R. Kalina, "The National Library of Medicine--Preservation of the Biomedical Literature," TAPPI Proceedings, p. 23.

4/ Statement of James H. Billington, Librarian of Congress, "Preservation of Print" Hearings, p. 45; OTA, p. 192; Buchanan, p. 27, citing Paul B. Kantor, Cost of Preservation Microfilming at Research Libraries: A Study of Four Institutions, Council of Library Resources (Washington, DC: 1986); and Lindberg and Kalina, p. 23.

5/ Gerry G. Vincent, "What's New in Paper," In-Plant Reproduction (March 1990), p. 29.

6/ Anthony M. Liberatore, "Production of Paper for Libraries," TAPPI Proceedings, p. 16; George W. Lawton, "Alkaline Papermaking Experience at Simpson Plainwell Paper Co.," TAPPI Journal (April 1989), pp. 59-63; Tom Wiley, "Converting to Alkaline: U.S. Fine Paper and Board Mills Step Up Pace," Pulp & Paper Buyers Guide 1989; and Vincent, pp. 29-30.

7/ Precise data on the conversion by U.S. paper mills to alkaline production processes is difficult to obtain because of continuing movement in this area.

Vincent reports that "25 percent [of U.S. papermaking mills], representing 18 percent of the country's papermaking capability, are now using [alkaline papermaking processes]...but further improvements...are leading the industry toward major conversions in the future" (p. 29).

However, Wiley reported earlier that "some 30% of the U.S. mills making fine paper grades already have converted to alkaline

sizing" (p. 43). According to the same article, "Pulp & Paper estimates that of the current 45,500 tpd [tons per day] of coated and uncoated free-sheet grades produced on nearly 300 machines in the U.S., approximately 30% is made under alkaline or neutral conditions and another 30% is on trial, with hopes of reaching full production. The remainder of free-sheet in the U.S. is manufactured by mills that are either studying the process or have tried and rejected it" (p. 48).

The consensus of these sources and others appears to be that approximately 30 percent of the industry has converted to alkaline papermaking processes. There are still other sources, although unconfirmed, which indicated that industrywide conversion will approach 40 percent in the near future.

The paucity of information in this area is cited in pending legislation to establish a national policy on permanent papers. Both S.J. Res 57 and H.J. Res. 226 would encourage that "[r]eliable statistics be produced by public or private institutions on the present production of acid free permanent papers and the volume of production required to meet the [requirements of] the national policy..."

8/ The United Kingdom has adopted a policy that all of its government papers be printed on acid-free paper. See statement of Senator Claiborne Pell, "Preservation of Print" Hearings, p. 3. The Canadian government recently completed a study on the use of alkaline paper for government printing. See "Report on the Runability of Alkaline Paperstocks within the National Printing Bureau," Canadian Government Printing Services (September 1989). Vincent reports that "more than 65 percent of Europe's paper production is alkaline" (p. 29).

9/ See S. Bruce Scaggs, "The U.S. Government Printing Office Perspective on the Use of Alkaline Paper," TAPPI Proceedings, p. 111; GPO testimony before the Subcommittee on Legislative Appropriations, Committee on Appropriations, House of Representatives, Hearings on Legislative Branch Appropriations for 1990, Part 2 (February 2, 1989), p. 599; and statement of Joseph E. Jenifer, Acting Public Printer, "Preservation of Print" Hearings, p. 84.

10/ Analysis is focused on paper purchased against quarterly term contracts because the contracts provide the most complete information on mill sources. Given the significant presence of alkaline papers on the current market, however, an assumption can be made that alkaline paper is present in relatively the same proportion in paper bought through open market purchases.

11/ The fact that GPO is buying alkaline paper at rates that greatly exceed the current acknowledged marketwide presence of such paper is an indication of its cost-effectiveness rather than the result of a requirement for alkaline paper.

APPENDIX A

1988 PRINTING AND WRITING PAPER ESTIMATES

	Tons
Total domestic production of printing and writing paper	21,793,600
Paper purchased by GPO for in-house use and Federal agencies in the Washington, DC, area	45,900
Paper used by commercial printers performing on GPO contracts	330,400
Paper purchased by GSA for agencies outside of the Washington, DC area	109,400
Total Government consumption	485,700
% of total domestic production consumed by Government	2.2

Sources: Total domestic production: American Paper Institute. Purchases by GPO and GPO contractors: Quality Control and Technical Department, GPO. GSA data includes purchases of fine and printing papers and xerographic papers only, per Office of Supplies and Paper Products Commodity Center, GSA, cited in Environment and Natural Resources Policy Division, Congressional Research Service, "Federal Paper Procurement," memorandum dated November 7, 1989.

APPENDIX B

JCP PAPER SPECIFICATIONS

A. Printing Paper

JCP A-10 Newsprint
JCP A-20 Machine-Finish Book
JCP A-25 Heat-Set Web Offset Machine Finish Book
JCP A-50 Machine-Finish Book End
JCP A-55 Heat-Set Web Offset Book
JCP A-60 Offset Book
JCP A-65 Light Weight Heat-Set Web Offset Book (Bible Paper)
JCP A-70 Groundwood Offset Book
JCP A-72 Flexural Offset Book
JCP A-75 Light Weight Offset Book (Bible Paper
JCP A-80 Opacified Offset Book
JCP A-90 Vellum-Finish Book, White and Colored
JCP A-100 Antique Book
JCP A-110 50% Antique Book
JCP A-120 50% Laid Antique Book
JCP A-165 Heat-Set Web Offset Coated Book
JCP A-170 Litho Coated Book
JCP A-180 Litho Coated Book
JCP A-205 Litho Coated Book
JCP A-220 Water-Resistant (Text) Book
JCP A-235 (Publication Grade) Matte Coated Offset
JCP A-240 Matte Coated Offset Book
JCP A-250 Laid-Antique Finish Book, White and Colored
JCP A-260 Dull Coated Offset Book
JCP A-270 Uncoated Permanent Paper

B. Mimeograph Paper

JCP B-10 Mimeograph, White and Colored
JCP B-20 25% Mimeograph

C. Duplicator Copy Paper, Liquid Process

JCP C-10 Duplicator Copy, Liquid Process, White and Colored

D. Writing Paper

JCP D-10 Writing, White and Colored
JCP D-15 Writing, Tablet Grade
JCP D-50 100% Fine Writing

E. Map Paper

JCP E-10 50% Map, Lithographic-Finish
JCP E-20 High Wet Strength Map, Lithographic-Finish

JCP E-30 Offset Map, Lithographic-Finish
JCP E-40 Chemical Wood Map, Lithographic-Finish
JCP E-50 50% Chart, Lithographic-Finish
JCP E-60 100% Chart, Lithographic-Finish

F. Manifold Paper

JCP F-10 Manifold, White and Colored
JCP F-20 25% Manifold
JCP F-30 25% Glazed Manifold

G. Bond Paper

JCP G-10 Bond
JCP G-15 Groundwood Forms Bond
JCP G-20 Translucent Bond
JCP G-30 Mimeograph Bond
JCP G-40 25% Bond, White and Colored
JCP G-50 25% Translucent Bond
JCP G-60 25% Opacified Bond, White and Buff
JCP G-70 50% Bond
JCP G-80 100% Bond

H. 100% Parchment Deed

JCP H-10 100% Parchment Deed

J. Ledger Paper

JCP J-10 Ledger, White and Colored
JCP J-20 25% Ledger
JCP J-30 100% Ledger

K. Index Paper

JCP K-10 Index, White and Colored
JCP K-20 25% Index, White and Colored
JCP K-30 100% Cream-White Index

L. Cover Paper

JCP L-10 Litho Coated Cover, White and India tint
JCP L-20 Vellum-Finish Cover, White and Colored
JCP L-30 Cloth-Lined Cover, White and Colored
JCP L-40 Laid-Antique Finish Cover, White and Colored
JCP L-50 Matte Coated Cover
JCP L-60 Dull Coated Cover

M. Manila Paper

JCP M-10 Manila

N. Kraft Paper

JCP N-10 No. 2 Kraft

O. Miscellaneous Paper

JCP O-10 Gummed, Conventional Adhesive
JCP O-12 Gummed, Special Adhesive
JCP O-25 Optical Character Recognition (OCR)
JCP O-40 Latex Saturated Surface Coated
JCP O-50 Masking, Photolithographic (Coated)
JCP O-60 Plain Copier, Xerographic, White, Natural, and Colored

P. Tag Board

JCP P-10 High-Finish Manila Tag

Q. Cardboard

JCP Q-10 Manila Board
JCP Q-20 Railroad Board, White and Colored
JCP Q-50 Chemical Wood Board, Colored
JCP Q-60 United States Postal Card, White and Colored
JCP Q-70 Gray Folding Bristol
JCP Q-80 High-Finish Red Wallet Board

R. Board

JCP R-10 Pressboard, Colored
JCP R-20 Newsboard
JCP R-30 Book Cover Board

Source: Joint Committee on Printing

APPENDIX C

TOTAL PAPER PURCHASES BY GPO, 1989
(PURCHASES BY POUNDS AND SHEETS)

(November 1, 1988-October 31, 1989)

Estimated total pounds purchased
(purchases by pounds and sheets): 93,328,600

On Contract	Open Market	Total
46,833,531 lbs.	12,624,070 lbs.	59,457,601 lbs.
---	13,060,000 lbs. (newsprint)	13,060,000 lbs. (newsprint)
1,215,439,000 sts.	286,502,494 sts.	1,510,941,494 sts. (approx. 20,811,000 lbs.)

Source: Government Printing Office

APPENDIX D

PAPER PURCHASED AGAINST QUARTERLY TERM CONTRACTS, BY JCP PAPER SPECIFICATION, 1989

(November 1, 1988-October 31, 1989)

POUNDS

JCP Spec.	Pounds
A-25	1,319,967
A-55	18,573,726
A-60	16,684,765
A-80	585,000
A-110	60,000
A- 0	19,998
A 0	100,000
A-.20	20,000
A-240	204,000
D-10	1,528,000
D-50	23,500
E-20	572,853
E-30	1,416,535
E-40	510,748
G-10	20,000
G-40	764,000
G-50	21,750
G-70	98,500
H-10	9,984
J-10	370,498
J-20	63,500
K-10	470,000
L-10	117,492
L-20	1,715,216
L-50	20,000
N-10	33,499
O-50	30,000
LOT 4*	940,000
LOT 40**	540,000
Total	46,833,531

* Catalog paper
** Fosdic paper

Source: Government Printing Office

APPENDIX E

PAPER PURCHASED AGAINST QUARTERLY TERM CONTRACTS, BY JCP PAPER SPECIFICATION, 1989

(November 1, 1988-October 31, 1989)

SHEETS

JCP Spec.	Sheets
K-10	708,000
K-20	1,835,000
O-60	1,205,400,000
Q-20	13,500
Q-60	7,050,000
R-20	369,000
R-30	61,500
Total	1,215,439,000

Source: Government Printing Office

APPENDIX F

GPO QUARTERLY TERM CONTRACTS:
PERCENTAGE OF ALKALINE PAPER VS. ACID PAPER PURCHASED

(November 1, 1988-October 31, 1989)

POUNDS

Contract Date	Alkaline	% Total	Acid	% Total	Total
11/1/88	5,072,492	45	6,239,393	55	11,311,885
2/1/89	5,726,712	41	8.078,723	59	13,805,435
5/1/89	9,584,379	70	4,087,688	30	13,672,067
8/1/89	6,136,227	76	1,907,917	24	8,044,144
Totals	26,519,810	57	20,313,721	43	46,833,531

SHEETS

Contract Date	Alkaline	% Total	Acid	% Total	Total
11/1/88	--	--	299,110,000	100	299,110,000
2/1/89	--	--	236,662,500	100	236,662,500
5/1/89	--	--	236,741,500	100	236,741,500
8/1/89	37,872,000	9	405,053,000	91	442,925,000
Totals	37,872,000	3	1,177,567,000	97	1,215,439,000

Source: Government Printing Office

APPENDIX G

GPO QUARTERLY TERM CONTRACTS:
PERCENTAGE OF ALKALINE PAPER VS. ACID PAPER PURCHASED

(November 1, 1987-October 31, 1988)

POUNDS

Contract Date	Alkaline	% Total	Acid	% Total	Total
11/1/87	10,946,857	59	7,723,163	41	18,670,020
2/1/88	8,150,088	53	7,370,571	47	15,520,659
5/1/88	9,490,785	76	3,073,597	24	12,564,382
8/1/88	7,710,534	63	4,501,551	37	12,212,085
Totals	36,298,264	62	22,668,882	38	58,967,146

SHEETS

Contract Date	Alkaline	% Total	Acid	% Total	Total
11/1/87	--	--	192,556,500	100	192,556,500
2/1/88	--	--	231,197,250	100	231,197,250
5/1/88	--	--	167,270,500	100	167,270,500
8/1/88	--	--	310,917,500	100	310,917,500
Totals	--	--	901,941,750	100	901,941,750

Source: Government Printing Office

APPENDIX B

ALKALINE AND ACID PAPER PURCHASED AGAINST TERM CONTRACTS, BY JCP PAPER SPECIFICATION

(November 1, 1988-October 31, 1989)

POUNDS

JCP Spec.	Alkaline	% Total	Acid	% Total	Total
A-25	660,000	50	659,967	50	1,319,967
A-55	12,045,349	65	6,528,377	35	18,573,726
A-60	9,510,550	57	7,174,215	43	16,684,765
A-80	435,000	74	150,000	26	585,000
A-110	--	--	60,000	100	60,000
A-120	--	--	19,998	100	19,998
A-180	40,000	40	60,000	60	100,000
A-220	--	--	20,000	100	20,000
A-240	204,000	100	--	--	204,000
D-10	1,528,000	100	--	--	1,528,000
D-50	23,500	100	--	--	23,500
E-20	--	--	572,853	100	572,853
E-30	--	--	1,416,535	100	1,416,535
E-40	87,750	17	422,998	83	510,748
G-10	--	--	20,000	100	20,000
G-40	--	--	764,000	100	764,000
G-50	21,750	100	--	--	21,750
G-70	5,000	5	93,500	95	98,500
H-10	9,984	100	--	--	9,984
J-10	300,498	81	70,000	19	370,498
J-20	--	--	63,500	100	63,500
K-10	370,000	79	100,000	21	470,000
L-10	117,492	100	--	--	117,492
L-20	1,110,937	65	604,279	35	1,715,216
L-50	20,000	100	--	--	20,000
N-10	--	--	33,499	100	33,499
O-50	30,000	100	--	--	30,000
LOT 4	--	--	940,000	100	940,000
LOT 40	--	--	540,000	100	540,000
Totals	26,519,810	57	20,313,721	43	46,833,531

Source: Government Printing Office

APPENDIX I

ALKALINE AND ACID PAPER PURCHASED AGAINST TERM CONTRACTS,
BY JCP PAPER SPECIFICATION

(November 1, 1988-October 31, 1989)

SHEETS

JCP Spec.	Alkaline	% Total	Acid	% Total	Total
K-10	648,000	92	60,000	8	708,000
K-20	400,000	22	1,435,000	78	1,835,000
O-60	36,600,000	3	1,168,800,000	97	1,205,400,000
Q-20	--	--	13,500	100	13,500
Q-60	--	--	7,050,000	100	7,050,000
R-20	199,000	54	170,000	46	369,000
R-30	25,000	39	38,500	61	63,500
Totals	37,872,000	3	1,177,567,000	97	1,215,439,000

Source: Government Printing Office

APPENDIX J

FORMAT DISTRIBUTION TO LIBRARIES,
FISCAL YEAR 1989

DEPOSITORY LIBRARY PROGRAM

Source	Microfiche copies	% Total	Paper copies	% Total	Total
GPO	13,726,075	58	9,756,161	42	23,482,236
DOE*	2,596,186	100	--	--	2,596,186
USGS*	--	--	872,695	100	872,695
Totals	16,322,261	61	10,628,856	39	26,951,117

* The Department of Energy and the U.S. Geological Survey distribute documents to depository libraries under agreements with GPO.

INTERNATIONAL EXCHANGE PROGRAM

Source	Microfiche copies	% Total	Paper copies	% Total	Total
GPO	583,810	88	77,483	12	661,293

Source: Government Printing Office

APPENDIX K

IMPACT OF EPA GUIDELINES:
ALKALINE AND ACID PAPER
PURCHASED AGAINST AUGUST 1989 QUARTERLY TERM CONTRACT,
BY JCP PAPER SPECIFICATION

(August 1, 1989-October 31, 1989)

POUNDS

JCP Spec.	Alkaline	% Total	Acid	% Total	Total
A-25	--	--	335,967	100	335,967
A-55	2,730,000	87	400,000	13	3,130,000
A-60	2,343,279	83	484,000	17	2,827,279
A-80	100,000	67	50,000	33	150,000
D-10	302,000	100	--	--	302,000
E-30	--	--	399,200	100	399,200
G-40	--	--	157,000	100	157,000
G-70	5,000	11	40,000	89	45,000
J-10	99,999	83	20,000	17	119,999
J-20	--	--	10,000	100	10,000
K-10	135,000	100	--	--	135,000
L-20	420,949	100	--	--	420,949
N-10	--	--	11,750	100	11,750
Totals	6,136,227	76	1,907,917	24	8,044,144

SHEETS*

JCP Spec.	Alkaline	% Total	Acid	% Total	Total
K-10	180,000	100	--	--	180,000
K-20	--	--	357,500	100	357,500
Q-20	--	--	13,500	100	13,500
R-20	99,000	100	--	--	99,000
R-30	--	--	25,000	100	25,000
Totals	279,000	41	396,000	59	675,000

* Does not include 442,250,000 sheets of xerographic paper because xerographic paper is exempted from the EPA guidelines.

Source: Government Printing Office

APPENDIX L

IMPACT OF EPA GUIDELINES:
ALKALINE AND ACID PAPER
PURCHASED AGAINST NOVEMBER 1989 QUARTERLY TERM CONTRACT,
BY JCP PAPER SPECIFICATION

(November 1, 1989-January 31, 1990)

POUNDS

JCP Spec.	Alkaline	% Total	Acid	% Total	Total
A-25	--	--	486,000	100	486,000
A-55	2,172,000	44	2,713,500	56	4,885,500
A-60	1,687,000	42	2,329,989	58	4,016,989
A-80	160,000	100	--	--	160,000
D-10	277,000	100	--	--	277,000
D-50	10,002	100	--	--	10,002
E-40	--	--	649,283	100	649,283
G-40	20,000	14	120,000	86	140,000
G-70	40,000	100	--	--	40,000
H-10	--	--	10,000	100	10,000
J-10	--	--	67,000	100	67,000
J-20	--	--	13,500	100	13,500
K-10	--	--	270,000	100	270,000
L-20	309,994	67	149,999	33	459,993
N-10	--	--	5,000	100	5,000
LOT 40	--	--	80,000	100	80,000
Totals	4,675,996	40	6,894,271	60	11,570,267

SHEETS*

JCP Spec.	Alkaline	% Total	Acid	% Total	Total
K-10	310,000	100	--	--	310,000
K-20	--	--	432,500	100	432,500
Q-20	--	--	15,000	100	15,000
Q-60	--	--	3,000,000	100	3,000,000
R-20	--	--	90,000	100	90,000
Totals	310,000	8	3,537,500	92	3,847,500

* Does not include 337,350,000 sheets of xerographic paper because xerographic paper is exempted from the EPA guidelines.

Source: Government Printing Office

APPENDIX 4.—OTHER SUBMISSIONS

A. NEW YORK PUBLIC LIBRARY (NYPL)

1. Permanent Paper Committee

February, 1990

Testimony Provided to the

U.S. House of Representatives

Subcommittee on Government Information,

Justice and Agriculture

On Behalf of H. J. Res. 226

To Establish a National Policy on Permanent Papers

By Barbara Goldsmith New York Public Library, Trustee

Chair of the NYPL Permanent Paper Committee

(151)

Testimony submitted by Barbara Goldsmith, New York Public Library Trustee and Chair of the NYPL Permanent Paper Committee

Under the auspices of the New York Public Library we have gathered together a Permanent Paper constituency of over 2,000 of the United States' most respected trade book and University press publishers, writers, editors and literary agents. In addition, we have received the enthusiastic endorsement, active participation and support of the following organizations: PEN (Poets, Essayists, Novelists, Non-fiction writers), the Association of American Publishers, Poets & Writers, and the Authors Guild, Inc. These groups have added to our constituency thousands more concerned citizens who are dedicated to the preservation of the printed word. On behalf of the Permanent Paper Committee we urge the adoption of H.J. Resolution 226 mandating that all governmental printing of quality be on Permanent Paper.

Under separate cover you will be receiving the endorsement of Dr. Timothy Healy, The New York Public Library President. The large group we represent would also like us to include some basic facts about Permanent Paper: The use of Permanent Paper vastly helps eliminate the problem of future paper deterioration. The present cost of restoring a deteriorated brittle book can exceed $1500. Microfilming a single book can cost approximately $100. After mill conversion, Permanent Paper (that lasts approximately five hundred years) is usually less expensive to manufacture than acidic paper (that self-destructs in approximately three

decades). The manufacture of Permanent Paper requires thirty percent less water than that of acidic paper and returns the water to its source in a less polluted condition. The entire process which uses an alkaline additive (calcium carbonate) is less corrosive and requires less electrical energy.

On behalf of the thousands of concerned individuals and members of the groups affiliated with our effort, we appeal to you to pass H.J. Resolution 226 to help preserve our cultural heritage for future generations.

2. President, NYPL

Testimony Submitted to:

Subcommittee on Government Information, Justice and Agriculture
Government Operations Committee
United States House of Representatives

In Support of H.J. Res. 226
To Establish a National Policy on Permanent Paper

Dr. Timothy S. Healy
President, The New York Public Library

Thank you for the opportunity to submit written testimony in support of H.J. Res. 226 which establishes a national policy to promote the use of alkaline paper. We are pleased that the Subcommittee is holding hearings on this important piece of legislation and urge prompt action in the House of Representatives. H.J. Res. 226 will help to reverse the tragic consequences of the widespread practice of printing on acidic paper; a practice that threatens our national heritage.

The New York Public Library has been a national leader in the struggle to preserve "brittle" books, with one of the oldest and largest preservation programs of its kind in the country. We are fighting a losing battle, however, as we witness historical records, government records, and the bulk of all publishing in this country being printed on a medium that disintegrates within 30 years. The current level of preservation activity nationwide barely makes a dent in the massive problem of deteriorating books. The preservation effort can only succeed by attacking the problem at the root: the very content of the paper being printed upon.

Public awareness of the severity of the problem of brittle books has greatly increased in recent years, and millions of dollars in Federal funds have been appropriated to address it. Passage of H.J. Res. 226 is needed in order to build on the momentum behind the preservation movement, and to create a national policy on permanent papers.

B. BOARD OF LIBRARY COMMISSIONERS, COMMONWEALTH OF MASSACHUSETTS

TESTIMONY ON BEHALF OF HOUSE JOINT RESOLUTION 226

The issue of paper permanence deserves concentrated national and international attention. The western world's cultural heritage and collective memory of the past 150 years is in danger of disappearing because of the acidic paper on which it is recorded. To address the slow disintegration of this paper from within, more than $100,000,000 has already been appropriated to deacidify or microfilm untold quantities of books and documents to preserve them and/or their information for future generations. If we, who are in a position to address this crisis at its source, do not act now, we will only bequeath a much more massive and costly problem than we face today to future generations.

An important step, and message to all players in the information field (e.g. papermakers, publishers and records creators), can be taken by passing House Joint Resolution 226 (as Senate Joint Resolution 394 was earlier) on permanent paper for publications and records of enduring value. Enough permanent paper is now being produced to satisfy the needs of publishers and records generators throughout this country at a cost approximately the same as that for acidic paper. Furthermore, it is estimated that fully half the paper mills in the United States will be producing permanent paper by 1992.

Beyond the effect this conversion will have on the life expectancy of our papers, records and books, the production of permanent paper by paper mills has been shown to be environmentally sound. Paper mills, like many other facilities, pollute the environment; however, by changing to the production of permanent paper, fewer pollutants and acids which contaminate the environment will be produced.

Therefore, I strongly urge the Sub-Committee on Government Information, Justice and Agriculture to vote and report out favorably House Joint Resolution 226 on permanent paper.

Gregor Trinkaus-Randall

Gregor Trinkaus-Randall
Collection Management Consultant
Massachusetts Board of Library Commissioners

C. AMERICAN LIBRARY ASSOCIATION

WASHINGTON OFFICE

AMERICAN LIBRARY ASSOCIATION

110 MARYLAND AVENUE N.E. • WASHINGTON, D.C. 20002 • (202) 547-4440

March 2, 1990

The Honorable Robert E. Wise, Jr.
Chairman
Subcommittee on Government Information,
Justice, and Agriculture
Committee on Government Operations
U. S. House of Representatives
Washington, D. C. 20515

Dear Mr. Wise:

On behalf of the American Library Association and its membership of more than 50,000 librarians, library trustees and other information professionals, let me congratulate you and your Subcommittee and staff on the February 21 hearing on H. J. Res. 226, to establish a national policy on permanent papers.

The Subcommittee hearing served a useful purpose in bringing up to date the shift to the use of alkaline paper and documenting the progress toward that objective. The fact that legislation is pending has helped to call attention to the damage done to library and archival collections by the acidic paper in use since the mid-nineteenth century, and to promote the use of permanent papers as a major solution. Final passage will further speed the usage of permanent paper, and the notation of such use in the publications, thus saving considerable future preservation costs. In the interest of supplementing the record, we ask that this letter and enclosures be included in the printed hearing.

The Association is strongly in support of H. J. Res. 226, as shown in the attached ALA resolutions. The problem of deteriorating printed materials due to acidic paper is an international one. Also enclosed are resolutions passed by the International Federation of Library Associations and Institutions.

EXECUTIVE OFFICES: 50 EAST HURON STREET, CHICAGO, ILLINOIS 60611 • (312) 944-6780

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The Honorable Robert E. Wise, Jr.
March 2, 1990
Page Two

If changes are to be made in the text of H. J. Res. 226, we note that the 11th "Whereas" clause is out of date because of events since the measure was first introduced. This clause should recognize actions by publishing associations and the Joint Committee on Printing.

We appreciate this opportunity to present the Association's views on the issue of permanent paper. The hearing record will be eagerly awaited by librarians, archivists, historians and many others both in this country and abroad.

Sincerely,

Eileen D. Cooke
Director
ALA Washington Office

EDC/pm

Enclosures - 4

WASHINGTON OFFICE

AMERICAN LIBRARY ASSOCIATION

110 MARYLAND AVENUE, N.E. • WASHINGTON, D.C. 20002 • (202) 547-4440

RESOLUTION ON NATIONAL POLICY ON PERMANENT PAPERS

WHEREAS, A joint resolution to establish a national policy on permanent papers, S.J.Res. 394, was introduced in the Senate in October 1988 by Senator Claiborne Pell (D-RI), Chairman of the Joint Committee on the Library and Chairman of the Senate Foreign Relations Committee; and

WHEREAS, Senator Pell has announced his intention to reintroduce the resolution early in 1989, and similar legislation may be introduced in the House; and

WHEREAS, The American Library Association urged publishers and federal, state and local governments to use permanent paper for books and other publications of enduring value in a resolution passed by the ALA Council on January 13, 1988, (1987-88 CD #34); and

WHEREAS, The ALA resolution noted that about one-fourth of the books in research library collections have become so embrittled that pages will break or crumble with use, and that hundreds of millions of dollars will be spent to salvage brittle materials if they continue to be printed on the acidic paper in general use since about 1850; and

WHEREAS, Extensive research conducted over the past several decades has demonstrated that alkaline papers have a significantly longer shelf life than acidic papers; and

WHEREAS, Production of alkaline paper in the U. S. has increased steadily within the last two years, is expected to double over the next two years, and is priced competitively; and

WHEREAS, S.J.Res. 394 would resolve that it is the policy of the U. S. that federal publications of enduring value be produced on acid-free, permanent papers and would specifically: (1) recommend that federal agencies require use of permanent paper for publications of enduring value; (2) recommend that federal agencies require use of archival quality papers for permanently valuable federal records; (3) recommend that American publishers use permanent papers for publications of enduring value, voluntarily comply with national standards, and note use of acid-free papers in publications and listings; (4) recommend that reliable statistics be produced on current and needed production of permanent papers; (5) recommend that the State Department make known this national policy to foreign governments and international agencies; and (6) require that the Library of Congress, the National Archives and Records Administration, the National Library of Medicine, and the National Agricultural Library jointly monitor progress and report annually to Congress; now, therefore, be it

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RESOLVED, That the American Library Association strongly support S.J.Res. 394, to establish a national policy on permanent papers, and its successor measures; and, be it further

RESOLVED, That the American Library Association express its appreciation to Senator Claiborne Pell, and offer support and assistance to Senator Pell and the chief sponsors of similar measures in the 101st Congress in establishing as national policy that federal records, books, and other publications of enduring value be produced on alkaline papers.

Adopted by the Council of the
American Library Association
Washington, D. C.
January 11, 1989
(Council Document #37)

Resolution on Use of Permanent Papers in Books and Other Publications

WHEREAS, It has been known for at least three decades that residual acids in most paper produced since the mid-nineteenth century have drastically reduced the life of books and other publications and documents; and

WHEREAS, The serious deterioration of the holdings of our libraries and archives has been well documented by several research libraries and archives in the United States; and

WHEREAS, It will require expenditures of hundreds of millions of dollars over the next several decades to salvage even the most essential materials by replication on microfilm or archival paper, and to prevent deterioration by deacidification; and

WHEREAS, This problem can be stopped at its source by the use of readily available alkaline paper with a prospective life of several hundred years; and

WHEREAS, Standards for permanence of uncoated paper have been promulgated, to wit:

American National Standards Institute ANSI Z39.48-1984	Permanence of Paper for Printed Library Materials (uncoated)
ANSI/ASTM Standard	D3290-86 Bond and Ledger Paper for Permanent Records (Type I, maximum permanence)
ANSI/ASTM Standard	D3208-86 Manifold Paper for Permanent Records (Type I, maximum permanence)
ANSI/ASTM Standard	D3301-85 File Folders for Storage Permanent Records (Type I, maximum permanence)
ANSI/ASTM Standard	D3458-85 Copies from Office Copying Machines for Permanent Records (Type I, maximum permanence; and

WHEREAS, The standard for permanence of coated paper is in preparation by a Committee of the National Information Standards Organization; and

WHEREAS, The American Library Association Council adopted in 1980 a resolution from the Resources and Technical Services Division affirming the need to move toward the production of volumes free from self-destructive substances for all texts of lasting usefulness; and resolving that the Center for the Book in the Library of Congress be requested to call together book manufacturers, papermakers, publishers, and commercial binders to encourage that they join in a cooperative effort to urge the production of books that will endure as long as they are needed; and

WHEREAS, The Board of Regents of the National Library of Medicine in February 1986 adopted a policy of actively encouraging the publishing industry to use permanent paper in the production of biomedical literature; and

WHEREAS, The Depository Library Council to the Public Printer of the United States on October 16, 1987, adopted a recommendation that permanent paper be used for Federal government publications of enduring value; and

WHEREAS, The National Information Standards Organization is writing to all American publishers to urge the use of paper meeting ANSI Standard Z39.48-1984 for the printing of publications of enduring value; now therefore, be it

RESOLVED, That the American Library Association urge all publishers to use uncoated paper meeting ANSI Standard Z39.48-1984 for publications of enduring value, and coated paper that is alkaline and can be expected to meet a similar standard for permanence; and to include a statement identifying publications using such paper on the verso of the title page of a book or on the masthead or copyright area of a periodical publication, and in catalogs, advertising, and bibliographic references; and, be it further

RESOLVED, That the U. S. Congressional Joint Committee on Printing be urged to adopt standards for permanent papers and encourage Federal government agencies to use such paper for publications of enduring value; and that the appropriate agencies of State and local governments be urged to adopt similar policies; and, be it further

RESOLVED, That the following organizations among others are commended for their leadership in researching and promoting the use of permanent papers for future additions to our heritage of knowledge: the National Endowment for the Humanities for financing research and preservation activities; the National Historical Publications and Records Commission, the Council on Library Resources and associated groups for sponsoring research and promoting the use of permanent papers; the Board of Regents of the National Library of Medicine and the Depository Library Council for their recent recommendations; the Library of Congress and other research libraries for their preservation activities including the quantification of the extent of the deterioration problem; the National Information Standards Organization and the American Society for Testing and Materials for developing technical standards for permanent record papers for various uses; the Technical Association of the Pulp and Paper Industry for developing methods for testing characteristics of paper; and those American publishers, especially many university presses, who have already adopted a policy of using permanent paper in their publications; and, be it further

RESOLVED, That copies of this resolution be distributed to the appropriate government and private organizations.

Adopted by the Council of the
American Library Association
San Antonio, Texas
January 13, 1988
(Council Document #34)

AMERICAN LIBRARY ASSOCIATION
50 EAST HURON STREET · CHICAGO, ILLINOIS 60611 · (312) 944-6780

RESOLUTION ON PERMANENT PAPER - PROGRESS AND NEXT STEPS

WHEREAS, In January 1988, the Council of the American Library Association adopted a resolution (1987-88 CD #34) urging expedited action by publishers; federal, state and local governments; and international organizations to promote the use of permanent (long-lasting, alkaline) paper in publications and documents; and

WHEREAS, In the succeeding years, major steps have been taken (shown in the attached chronology) toward achieving these goals; now, therefore, be it

RESOLVED, That the American Library Association vigorously pursue the following actions:

1. Encourage passage by the U.S. House of Representatives of H.J.Res. 226 and final enactment of a national policy on permanent paper;

2. Support completion of an ISO international standard on permanent paper based on a revision of the U. S. standard;

3. Stimulate and endorse state legislation requiring the use of permanent paper for appropriate state and local government publications and documents; and

4. Continue to promote a standard and universal practice of indicating the nature of the paper in books, publications, and where appropriate, documents; and, be it further

RESOLVED, That copies of this resolution be sent to appropriate organizations both in the United States and abroad; and, be it further

RESOLVED, That the American Library Association commend and thank the numerous organizations and individuals who have contributed to the progress thus far achieved in advancing the production and use of permanent paper.

Adopted by the Council of the
American Library Association
Chicago, Illinois
January 10, 1990
(Council Document #53)

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CHRONOLOGY
to accompany
RESOLUTION ON PERMANENT PAPER - PROGRESS AND NEXT STEPS

1988

January — The National Library of Medicine establishes a program to promote the use of permanent paper in medical and biological literature.

February — The National Information Standards Organization mails a copy of its 1984 standard on permanent uncoated paper (ANSI Z39.48) to all U.S. publishers.

April — The Connecticut legislature establishes and directs a study to assess the feasibility of printing all state publications and official records on permanent paper.

August — The Commission on Preservation and Access establishes a Washington office to promote the preservation of endangered publications and documents, and the widespread use of permanent paper.

October — Senator Claiborne Pell of Rhode Island, Chairman of the Joint Committee on the Library, introduces a Senate Joint Resolution to establish a national policy on permanent papers.

A Paper Preservation Symposium sponsored by the Technical Association of the Pulp and Paper Industry (TAPPI) is held in Washington, D.C.

1989

February — Senator Pell, with cosponsors, reintroduces his permanent paper measure as S.J. Res. 57.

The Association of American Publishers urges its members to use permanent paper in first printings of trade books.

March — At a meeting at the New York Public Library, numerous authors and publishers pledge the use of permanent paper for first printings of their books; and their signatures are published in The New York Times.

Representative Pat Williams of Montana introduces a companion measure on permanent paper identical to S.J. Res. 57, H.J. Res. 226.

Permanent paper is among the issues discussed at a landmark National Conference on the Development of Statewide Preservation Programs held at the Library of Congress and sponsored by eleven federal agencies and national organizations.

May — The House Subcommittee on Science, Research and Technology conducts an extensive hearing on the preservation of print, with emphasis on the use of permanent paper, at which representatives of paper companies testify to the economic competitiveness of permanent paper and the trends towards its production by U.S. producers of printing and writing papers.

At a plenary meeting in Washington, D.C. of Technical Committee 46 (Documentation) of the International Standards Organization (ISO), steps are taken to expedite the development of an international standard for permanent paper based upon a revision of the U.S. Standard Z39.48.

July — The House Appropriations Committee, in its report on the FY 1990 Legislative Branch Appropriations Bill, directs the Government Printing Office to develop "a strategy and schedule to convert" U.S. government printing to permanent paper.

The Senate adopts, without objection, S.J. Res. 57 to establish a national policy on permanent paper, introduced by Senator Pell with 46 Senate cosponsors.

Connecticut Public Act 89-167 on permanent paper for state and local records and publications takes effect.

August — For the first time, the International Federation of Library Associations and Institutions (IFLA), at its annual conference in Paris, France, adopts three resolutions urging the use of permanent paper, including by IFLA itself and by United Nations organizations.

October — The International Publishers Association, meeting in Frankfurt, Germany, adopts a resolution urging its component national publishing associations to promote the use of permanent paper in books and other publications.

November — The National Information Standards Organization circulates for comment a proposed revision of its 1984 permanent paper standard Z39.48 that includes coated as well as uncoated paper.

Resolutions on Permanent Paper

Passed August 25, 1989 by the
International Federation of Library Associations and Institutions
55th Annual Meeting, Paris, France

PERMANENT PAPER: RESOLUTION 1

It is generally recognized and scientifically documented that the acidic papers in general use for books, other publications and documents since the mid-nineteenth century disintegrate in a relatively short period of time. Major and costly efforts are required to salvage what can be saved of the most important existing publications and documents. Therefore, it is essential to avoid, as far as possible, the need for continuing these expensive salvage efforts in the future.

Acid-free permanent papers are now being produced in increasing quantity at costs comparable with the costs of acidic papers and the production of acid-free permanent paper has less of an adverse impact on the environment. Therefore,

BE IT RESOLVED that IFLA urge its members to recommend strongly to **their governments** that policies be adopted encouraging the use of acid-free permanent papers; to **paper manufacturers** that increased supplies of acid-free permanent papers be produced for publishing and writing; to **publishers** that they use acid-free permanent papers in books and other publications themselves, in catalogs and advertizing and in bibliographic materials; and

BE IT FURTHER RESOLVED that the International Publishers Association be urged to recommend to its national associations that publishers move to the use of acid-free permanent paper as rapidly as possible; and

BE IT FURTHER RESOLVED that the Director General of UNESCO be requested to incorporate this issue in the work plan of that organization, and as a first step to survey, monitor, and report on the present use of acid-free permanent papers and to promote their universal use in cooperation with national governments, the International Publishers Association and IFLA; and

BE IT FURTHER RESOLVED that this Resolution be sent on an expedited basis to IFLA members and to the Director General of UNESCO, the President and Secretary General of the International Publishers Association, Directors of national libraries, and to ISO Technical Committee 46.

PERMANENT PAPER: RESOLUTION 2

Lack of an international standard for acid-free permanent paper is hampering the adoption of the use of such paper. Therefore,

BE IT RESOLVED that ISO/TC46 move quickly to develop international standards for coated and uncoated acid-free permanent papers.

PERMANENT PAPER: RESOLUTION 3

International organizations such as IFLA, ICA, UNESCO and other specialized agencies of the UN should set an example for their members. Therefore,

BE IT RESOLVED that IFLA adopt the use of acid-free permanent paper for its publications and documentation and urge the above mentioned organizations to do the same.

All three resolutions endorsed by:
IFLA Conservation Section
IFLA Core Programme on Preservation and Conservation
US Association members of IFLA

D. THE SOCIETY OF AMERICAN ARCHIVISTS

The Society of American Archivists

600 S. Federal, Suite 504, Chicago, Illinois 60605 (312) 922-0140

Officers

John A. Fleckner, President
Historical Society

Frank B. Peterson, Vice President
National Archives and Records Administration

Linda Henry, Treasurer
National Archives and Records Administration

Council

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Linda M. Matthews
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Archie Motley
Chicago Historical Society

James M. O'Toole
University of Massachusetts at Boston

Mary Jo Pugh
Consultant

Robert Sink
New York Public Library

Owen C. Veal
Executive Director

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Government, Information, Justice and Agriculture Subcommittee

April 10, 1990

The Honorable Bob Wise
Chairman, Subcommittee on Government Information,
Justice, and Agriculture
B349C Rayburn Building
Washington, DC 20515

Dear Mr. Wise:

I am pleased to forward to you the enclosed statement by the Society of American Archivists.

The Society strongly supports H.J. Resolution 226 to establish a national policy on permanent paper. As the representative of more than four thousand archivists and archival institution, the Society of American Archivists is pleased to join with Americans of many backgrounds and vocations in support of this important preservation measure.

I hope you will call on us for any additional information or assistance in addressing this important national concern.

Sincerely,

John A. Fleckner

John A. Fleckner
President

Statement of
The Society of American Archivists

Submitted to the Subcommittee on
Government Information, Justice, and Agriculture
of the
Government Operations Committee
of the
House of Representatives

April 1, 1990

The Society of American Archivists endorses H.J. Resolution 226 to establish a national policy on permanent paper and urges its immediate adoption.

SAA is the national professional association of individuals, groups, and institutions interested in the preservation and use of records, personal papers, and historical manuscripts. From its inception over 50 years ago, SAA has provided leadership and coordinated activities designed to protect and make accessible the rich documentary heritage in our nation's public and private archives, historical societies, and libraries.

The overwhelming majority of these documents are on paper - always assumed to give permanence to the memories, experiences, thoughts, and ideas it records. Yet, many modern papers in our nation's repositories have deteriorated beyond use because of high acid levels that destroy them from within. Countless others are at high risk. These will decay and become unusable without immediate and costly intervention. This ongoing deterioration poses a fundamental threat to the continued availability of our rich cultural heritage and its transmission to future generations.

For archives, historical societies, and libraries, a particular concern is that the documents entrusted to their care are unique. If these deteriorate and become brittle, the information they contain, the evidence they provide, and the cultural significance they hold are lost. Public and private archives face additional concerns since they are required through established retention schedules to accept certain records, even if they are chemically and physically unstable and will inevitably deteriorate with time. In our institutions and government agencies, the paper used to document the conduct of business today will affect our access to the records of tomorrow. Records are transferred to archives years after they are created, and archives inherit the chemical and physical imperfections of the past.

Throughout the years, SAA has developed technical and administrative workshops, published books and articles, and offered consultancies to assist archivists, curators, and librarians in addressing the preservation problems that have resulted, in part, from the use of poor quality paper to create our documentary materials. However, only the production and use of permanent paper will end the threat posed by brittle paper and permit the reallocation of resources to other pressing preservation needs. To this end, the efforts of the United States Congress to develop a national policy on permanent paper focus national attention on this issue in a dramatic and effective manner. In response to the urgency of this national crisis, Arizona, Connecticut, Indiana, North Carolina, and Virginia have passed legislation on permanent paper and its use for state documents. Nine other states are actively considering the issue as well.

On its own part, SAA acknowledges its responsibility to assume a leadership role in advancing the production and use of permanent paper within the archival community. Currently, all SAA publications are printed on paper that meets national standards for permanence. For its upcoming annual meeting, SAA will present a special session on the national movement towards permanent paper. Most importantly, through the activities of its Preservation Section, SAA will work cooperatively with archivists, records managers, and other custodians to ensure the use of permanent paper for all documents of enduring value.

The passage of H.J. Res 226 is a key component that will make possible the national, cooperative effort to preserve our documentary heritage.

E. NORTHEAST DOCUMENT CONSERVATION CENTER

February 1, 1990

Testimony Provided to the

U.S. House of Representatives

Subcommittee on Government Information,

Justice and Agriculture

On Behalf of H. J. Res. 226

To Establish a National Policy on Permanent Papers

By Ann Russell, Director

Northeast Document Conservation Center

The Northeast Document Conservation Center (NEDCC), in Andover, Massachusetts, wishes to express its support for H.J. Res. 226 to Establish a National Policy on Permanent Papers. As a nonprofit, regional conservation center, our organization provides conservation services and technical assistance to thousands of libraries, historical organizations and museums in the northeastern region and beyond. Our services include laboratory treatment of books and paper, microfilming, and consultation. Through our relationship with client institutions, we are in a unique position to observe the ways in which a broad range of collection holding institutions are affected by the brittle paper problem. The consequences of the problem are devastating. The only long-range solution is stopping it at its source through the use of permanent paper for the creation of books and records of enduring value.

Through our Field Service Office, NEDCC has surveyed the collections of more than two hundred and fifty libraries and historical organizations. The deterioration of brittle books and documents is a universal problem for these institutions. Data from surveys undertaken by major research libraries indicate that approximately 33% of their collections are already so brittle that they cannot withstand normal use. For many historical organizations and older libraries, the percentage of deteriorated material is even higher. Many collections are not open to the public because their condition is too fragile. Numerous objects cannot be loaned or exhibited without prior conservation treatment.

Because NEDCC performs conservation treatment and microfilming for its clients, we are well aware of the high costs involved in restoring or microfilming books and documents once they are brittle. The cost of repairing a deteriorated book can easily exceed $1,500. The cost of restoring a brittle wall map or a yellowed architectural drawing is often $800 or more. Even microfilming, which is a low cost alternative for preserving information without retaining the original format, can cost more than $100 per title, including the costs of preparation.

Enough material is already damaged to keep our Center busy for centuries. Our interest is in helping our client institutions to reduce the need for preservation treatment tomorrow for the materials they are acquiring today. Alkaline paper is currently available and costs no more than acidic paper. The proposed legislation will result in no additional cost to the government. In fact, the potential savings are staggering, in terms of avoiding future microfilming costs. NEDCC urges the Subcommittee to support this resolution.

F. U.S. NATIONAL COMMISSION ON LIBRARIES AND INFORMATION SCIENCE

United States
National Commission on
Libraries and Information Science

November 8, 1989

The Honorable Bob Wise, Chairman
Government Information, Justice and Agriculture Subcommittee
414 Cannon House Office Building
Washington, D.C. 20515-4803

Dear Representative Wise:

The U.S. National Commission on Libraries and Information Science (NCLIS) is an independent agency within the executive branch, created in 1970 through PL 91-345, and charged with advising the President and Congress on national library and information science policy issues. The fifteen Commissioners are appointed by the President with the advice and approval of the Senate. As part of our policy, planning and advice program, we provide input on legislation relating to national information policy. We understand that your Government Information, Justice and Agriculture Subcommittee has before it H. J. Res. 226, in support of a national policy on the use of permanent paper.

The Commission has long supported such legislation, beginning with Senator Claiborne Pell's original bill in the 100th Congress. We were heartened by the passage of his S. J. Res 57 this August, and noted that it was jointly referred to the Committee on House Administration and the House Government Operations Committee.

The Commission has unanimously voted to support both the House and Senate resolutions with a suggested revision: that these measures be amended by inserting the words "the Chairman of the U.S. National Commission on Libraries and Information Science," after "The Librarian of Congress," in Section 3. The Commission believes it could productively participate in the monitoring function described in this section.

We take the issue of the use of permanent paper very seriously. The Commission passed a resolution on the issue last January (enclosed) and has established its own

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Fax: (202) 254-3111

internal policy of using only permanent paper for its reports and other publications. We are a voting member of the National Information Standards Organization and are participating in a revision by NISO of the American National Standard for permanence of paper, which is referred to in H.J. Res 226.

It is our hope that H.J. Res. 226 will receive the prompt consideration which this vital legislative initiative calls for. We would appreciate hearing from you or your staff concerning the status of this bill within your subcommittee, and the Commission stands ready to assist you in your deliberations should you desire additional comments or testimony. Please contact James R. Benn at the NCLIS office with any questions or comments.

Sincerely,

Susan K. Martin

Dr. Susan K. Martin
Executive Director

cc: R. Gelman

RESOLUTION ON PERMANENT PAPER

WHEREAS, the U.S. National Commission on Libraries and Information Science is mandated by PL 91-345 to advise the President and the Congress on issues and problems confronting the nation's libraries; and

WHEREAS, such an urgent issue now exists, to wit: the imminent loss of a significant portion of the world's intellectual and cultural record because of the accelerating deterioration of books and other documents (i.e., technical journals) printed on acid-based paper; and

WHEREAS, nearly 80 million books in North American research libraries alone are endangered, with most of the embrittlement caused by paper deterioration due to residual acids; and

WHEREAS, it will cost American libraries untold millions of dollars to preserve through various means even a fraction of the books and journals which are already brittle; and

WHEREAS, the opportunity exists to prevent such deterioration in the future at no additional cost by printing and publishing all materials of lasting value on alkaline paper, whose availability is rapidly increasing, whose costs are comparable to acidic paper, and to which approximately a quarter of the publishing industry has already converted to some extent; and

WHEREAS, such a transition would be facilitated by a revision of the policy of the federal government, which alone consumes a 2.5% of the nation's printing and writing paper; now, therefore be it

RESOLVED, that the U.S. National Commission on Libraries and Information Science endorse the use of permanent paper for all publications of enduring value, including its own, and recommend that other agencies of the federal government (as well as private publishers) do the same, and be it further

RESOLVED, that the U.S. National Commission on Libraries and Information Science strongly urge the President and Congress promptly to establish a national policy on the use of permanent paper, including, among its objectives, the use of such paper in all future federal government publications and documents of lasting significance; and be it further

RESOLVED, that the U.S. National Commission on Libraries and Information Science stand ready to assist in the implementation of this policy; and be it further

RESOLVED, that copies of this resolution be distributed to the President, the relevant committees of Congress, and other appropriate governmental bodies and non-governmental organizations.